JULY-AUGUST 1952

SIGNAL

Communications-Electronics-Photography

AFCA ANNUAL AWARDS

Newest advance in railroading...

ERIE'S *Radio-Equipped* Main Line!

Erie Railroad's *Main Line*—85% of it—is now equipped with *Farnsworth* radio. In clear or foul weather, orders and information can be transmitted—linking cab and caboose...moving trains...dispatchers...wayside stations...even crewmen on foot. This is the most extensive and comprehensive main line radio-telephone communication system ever installed. Soon its coverage will be complete—providing full radio communication between trains and 59 wayside stations, New York to Chicago. 204 mobile units are already in service; 68 more are in process of installation—in addition to 55 mobile and 6 base stations in yard and terminal service. All equipment was engineered and manufactured by an associate of International Telephone and Telegraph Corporation. Comprehensive, practical, fully-proven radio systems are now available to meet the exacting requirements of America's railroads.

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INTERNATIONAL TELEPHONE AND TELEGRAPH CORPORATION, NEW YORK, N. Y.

For information on "*Farnsworth*" railway radio communications, address *Federal Telephone & Radio Corporation*, Clifton, N. J.

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"BOMBING THROUGH OVERCAST"! Yet RCA SHORAN can determine your position "over target" to an accuracy of better than 50 feet in 100 miles or more—*and do it in less time than it takes to tell it.*

Developed by RCA for the Air Force to aid blind bombing during World War II, SHORAN is helping to set astonishing records for pin-point accuracy under conditions where visual bombing would be impossible!

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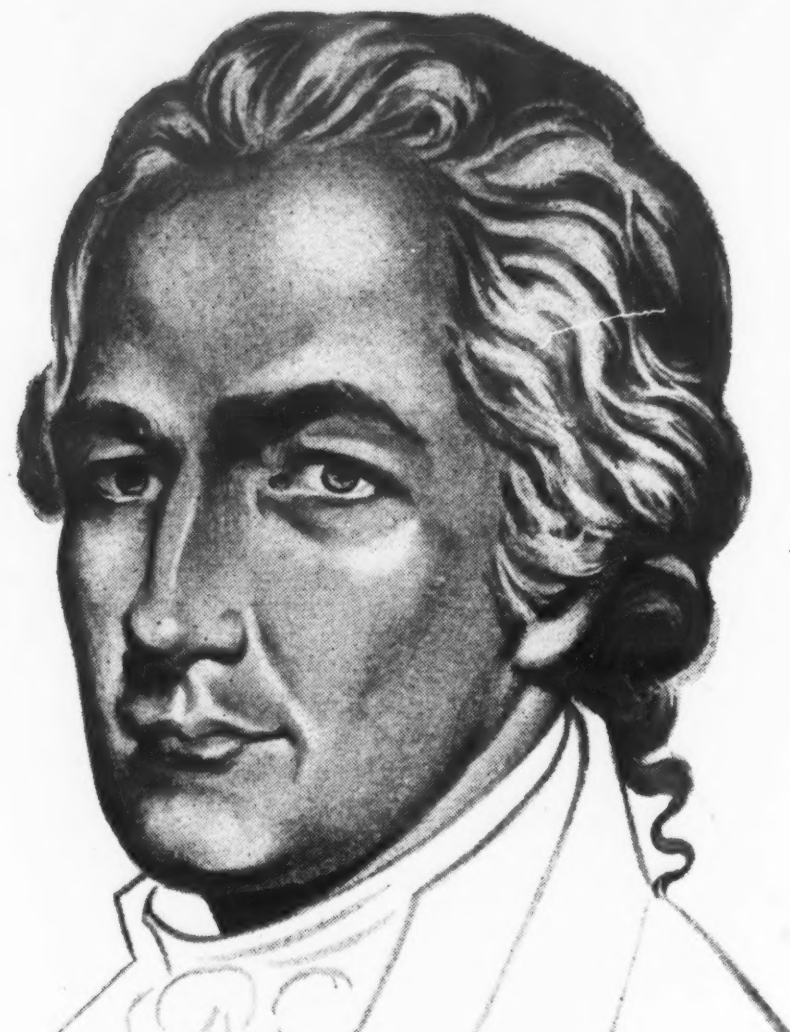
SHORAN development is just one example of the way RCA works in close co-operation with the military services to guarantee U.S. supremacy in electronics. Meet the RCA Engineers and Field Technicians in *your* branch of service.

RCA

RADIO CORPORATION of AMERICA

ENGINEERING PRODUCTS DEPARTMENT — CAMDEN, N.J.



Guide words for today—
written by

ALEXANDER HAMILTON

"In framing a government which is to be administered by men over men, the great difficulty lies in this: you must first enable the government to control the governed; and in the next place oblige it to control itself."

America would not be the great nation it is but for men like Alexander Hamilton . . . men who knew the dangers and pitfalls of bad government . . . men whose personal integrity made them capable of governing others well.

Every day we are confronted with headlines proving only too conclusively that many persons in responsible positions place their own selfish interests ahead of the interests of *those who put them there.* Scandal and corruption make sensational reading . . . and disgraceful reading.

Let us revert to the principles of men such as Alexander Hamilton . . . men who practiced self-control and self-government . . . *and only then considered themselves fit to govern others.*

W. B. Stuart

President

SIGNAL

Communications-Electronics-Photography

Journal of the Armed Forces Communications Association

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VOLUME 6 **JULY-AUGUST 1952** **NUMBER 6**

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DEPARTMENTS

SIGNAL is published bi-monthly by the Armed Forces Communications Association at 1624 Eye St., N. W., Washington 6, D. C. Entered as Second-class matter at Post Office, Washington, D. C., September 6, 1946, under Act of March 3, 1879. Additional entry at Baltimore, Md.

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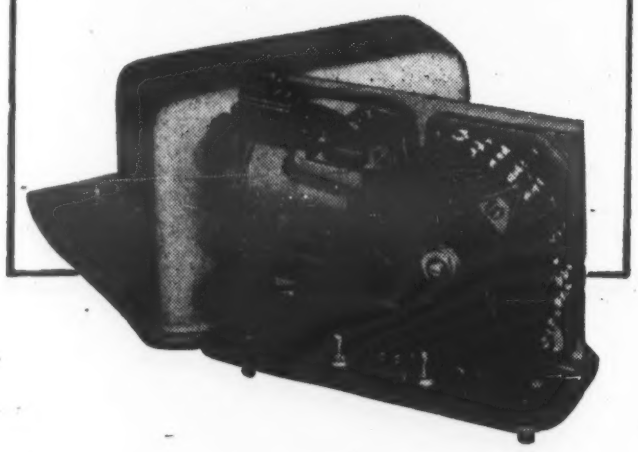

***Switches, too,** are hermetically sealed! This compact Type 44 Rotary Switch assembly is only 3⅛" by 4 11/16" by 2 3/16". One shown provides three bank levels — 10 points plus home. Six levels also available.*

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- **WITHSTANDS 250°C**
- **HAS HIGH SPACE FACTOR**
- **EXCELLENT ELECTRICAL PROPERTIES**

A NEW MAGNET WIRE

If smaller, lighter electrical components are needed in the military electronic gear or aircraft controls you are concerned with, investigate the use of CEROC ST, the newest Sprague magnet wire.

Application of a single Teflon overlay to the base ceramic insulation results in a magnet wire which has many of the best properties of both Sprague's CEROC 200 silicone-coated ceramic-insulated wire and CEROC T double-Teflon ceramic-insulated wire.

Complete details of this important new development are given in Engineering Bulletin 404, available on letterhead request.

For latest information on CEROC 200 and CEROC T, write for Bulletins 401-B, 402-H, and 403-C.

SPRAGUE

SPRAGUE ELECTRIC COMPANY

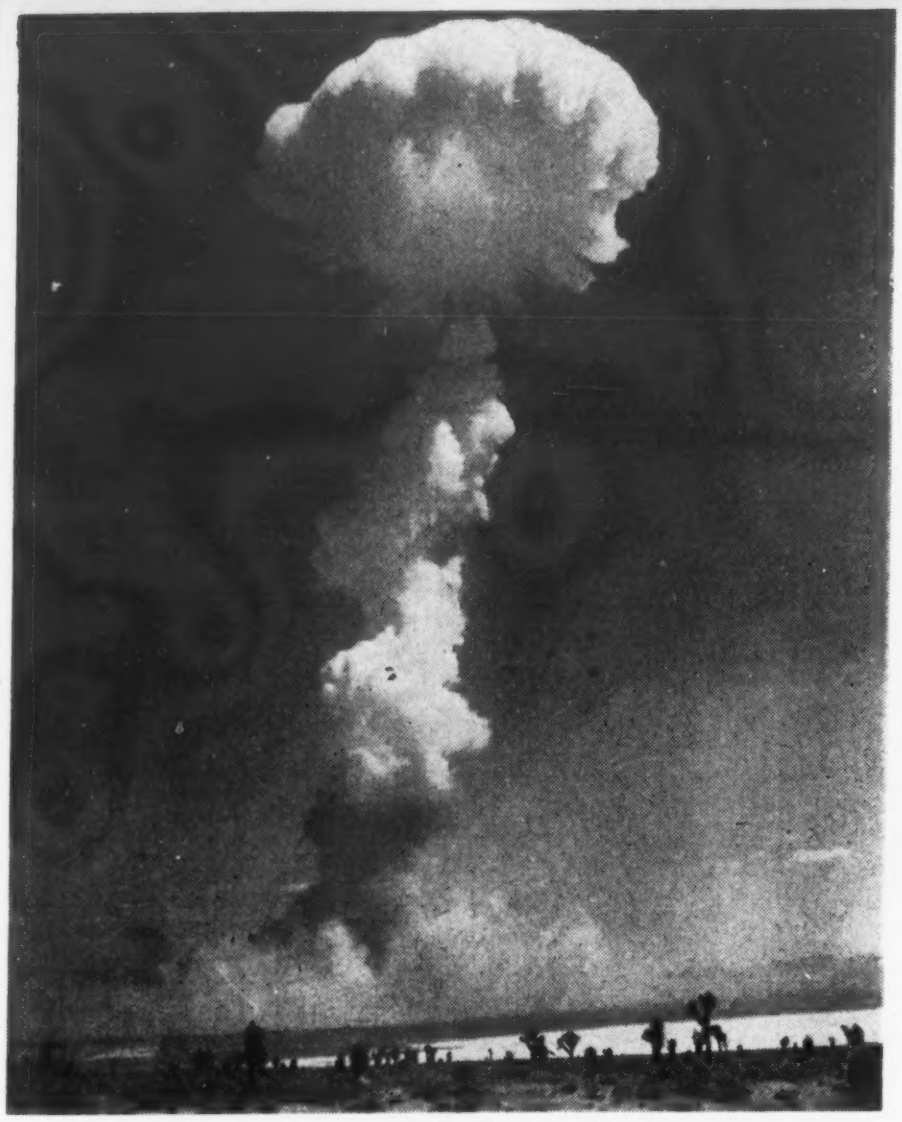
287 Marshall Street, North Adams, Massachusetts

CEROC® ST

QUICK DELIVERY

Immediate deliveries from stock on small sample quantities of all CEROC wires as well as short delivery cycles on production runs are now in effect.

There is plenty of room for your orders on the production schedules of our North Adams, Mass. and Bennington, Vt. plants with their newly-expanded facilities.



It's A

It's stupendous! It's colossal! In fact, it's "atomic" in the film and television worlds these days. The first public atomic blast at Yucca Flats, Nevada on April 22, 1952, stole the title of the greatest show on earth from the circus. But it was not just a show—it was a scientific experiment and a notice to all concerned that the United States still held a convincing lead in the international atomic race.

To report and record the event were 200 correspondents and cameramen—the biggest concentration of headline reporters and topnotch photographers since the surrender on the Missouri in Tokyo Bay, which was shortly after the birth of the atomic age.

This article will not attempt to cover the scientific, military or repertorial aspects of the "big shot"—since this is being accomplished by qualified experts in each field. The pictorial coverage (motion picture and still) which recorded the event for the public and posterity, is a fascinating story in itself.

Due to the close cooperation between the Atomic Energy Commission and the Department of Defense in the public information field, the event emphasized again the teamwork that is possible, even on such a security subject, between the press and the Signal Corps. It resulted in getting the word, and the pictures, to the public who have a right to a ringside seat through the magic of the camera's eye.

Mr. Richard Elliott of the Atomic Energy Commission and his deputy. Mr. Lee Hargus of the Department of Defense, ably handled the many problems dealing with the writing press, the radio, and television. Mr. Elton Lord of AEC, and I, acting as his pictorial deputy, had the responsibility of seeing that the photographers got the maximum picture coverage consistent with security limitations. This meant establishing the closest teamwork between the media and the Signal Corps camera units covering the event. Major William Sheehan of the Signal Corps Photographic Center handled the coordination of photography activities for the exercise while Major Victor Bloecker had special teams from the Signal Corps Photographic Center available, together with photo units from the 301st Signal Photo Company, whose Lieutenant Simmons acted as assistant officer.

The Signal Corps mobile photo lab was also made available to augment the Sandia Lab at Camp Mercury. They teamed up to handle official and emergency developing of still photos on the big day.

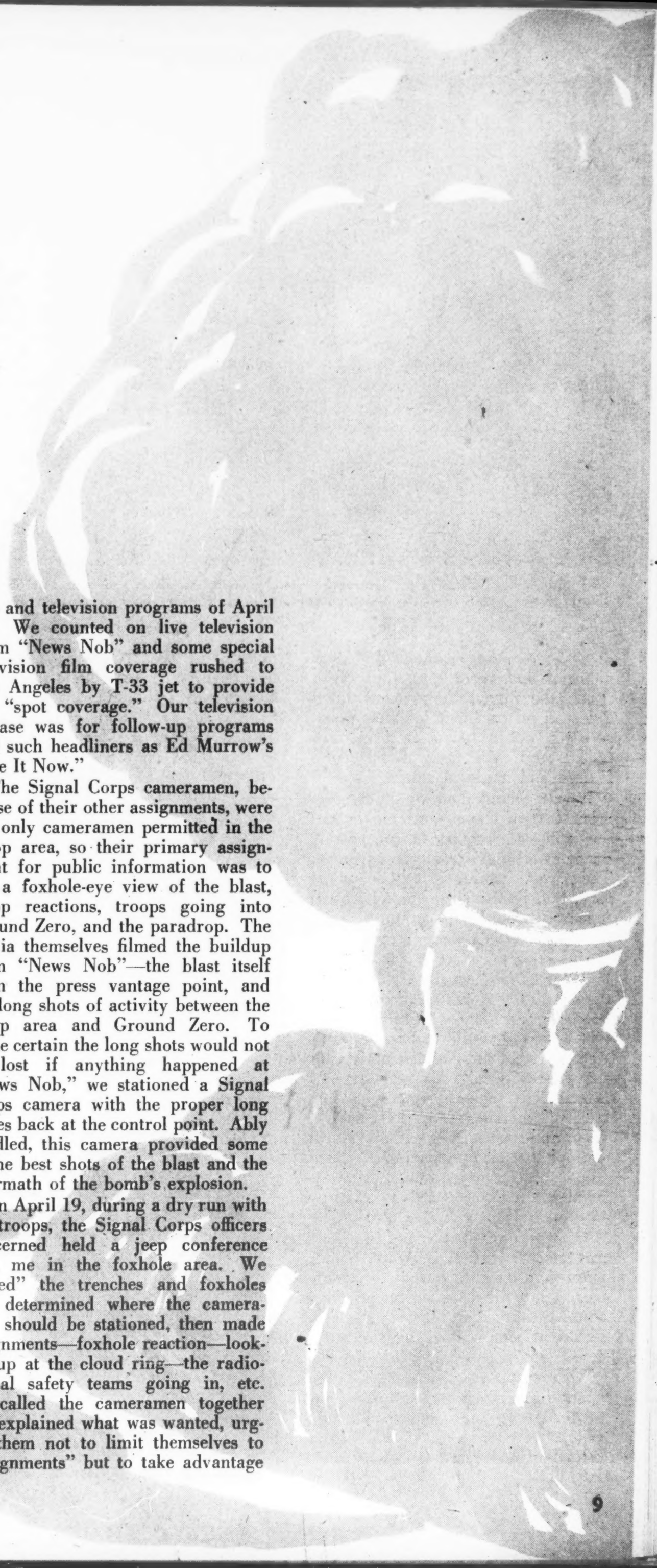
Mr. Lord handled the registration of photographers, camera passes and all the details required to clear the newsreels, TV-film outfits and still photographers into Camp Mercury, the AEC camp site some 75 miles northwest of Las Vegas.

More than a week before H-hour, Mr. Lord had selected a site some 10 miles from Ground Zero, which was a natural camera platform for photographers—with an open space before it where the press and radio could observe the explosion. The little hill, forward of the control point, became known as "News Nob." There were loose boulders, rattlesnakes and lizards around, but the

Bob Considine of International News Service has his personal camera checked by Lt. Col. B. Kalish as another INS correspondent and Les Haynes, Dept. of Defense, look on.

Atomic

BY: LT. COLONEL BERGRAM KALISH, SigC.
CHIEF, NEWSREEL SECTION
OFFICE OF PUBLIC INFORMATION
DEPARTMENT OF DEFENSE



pre-blast activity caused the rattlers to disappear. They probably thought photographers were poison anyway, and the lizards just hid under rocks and refused to pose.

I was delegated to coordinate the public information efforts of the Signal Corps cameramen with those of the newsreels, TV and the stills, since our job was not to duplicate their coverage but to supplement it.

Now the Signal Corps photo units had a triple assignment. They were to work closely with the AEC experts in making highly technical classified film for Test Command; they were to make an official Army documentary for the record, and they were to make supplementary coverage for public information.

Those who are familiar with picture coverage will realize that this posed a real problem. The stills for press had to be ready for radiophoto as soon as possible on shot day, and the newsreel and TV release coverage had to meet deadlines which could not be changed.

Through the cooperation of the Army Pictorial Service and the officers on the spot, we worked it out by dividing the motion picture footage into three categories: 1) Test Command—classified; 2) Documentary with a project number; and, 3) a special project number for the official public release footage.

Thus, when the footage reached the Signal Corps Photo Center, some 30,000 feet of exposed film could be quickly divided. The 4,000 unclassified feet of pay-off release film could be rushed through the lab and edited in time to catch the newsreel make-ups and television programs of April 24. We counted on live television from "News Nob" and some special television film coverage rushed to Los Angeles by T-33 jet to provide the "spot coverage." Our television release was for follow-up programs and such headliners as Ed Murrow's "See It Now."

The Signal Corps cameramen, because of their other assignments, were the only cameramen permitted in the troop area, so their primary assignment for public information was to get a foxhole-eye view of the blast, troop reactions, troops going into Ground Zero, and the paradrop. The media themselves filmed the buildup from "News Nob"—the blast itself from the press vantage point, and the long shots of activity between the troop area and Ground Zero. To make certain the long shots would not be lost if anything happened at "News Nob," we stationed a Signal Corps camera with the proper long lenses back at the control point. Ably handled, this camera provided some of the best shots of the blast and the aftermath of the bomb's explosion.

On April 19, during a dry run with the troops, the Signal Corps officers concerned held a jeep conference with me in the foxhole area. We "cased" the trenches and foxholes and determined where the cameramen should be stationed, then made assignments—foxhole reaction—looking up at the cloud ring—the radiological safety teams going in, etc. We called the cameramen together and explained what was wanted, urging them not to limit themselves to "assignments" but to take advantage

The 16th Signal Operation Bn. provided 12 teletypewriter machines and operators for the press at News Nob, Nevada for the Atom Bomb Tests being held at Nevada Proving Grounds.

of whatever they spotted that was pictorial and shoot that, too. As a result, the Signal Corps cameramen did such an excellent job that many of their "cut-in" shots of faces, attitudes, etc., were used in television feature and newsreel stories.

It was agreed that we should earmark certain teams—one movie and one still cameraman, to concentrate on newsreel and press type coverage. They were making it for documentary, too, so the entire pattern fitted together without duplication.

A courier jeep was set up to rush the first photos from the troop area to "News Nob" where I would join them with the team film there. Major Bloecker and Lieutenant Simmons directed coverage in the troop area. As they would not return until after the paradrop following the blast, I directed coverage at "News Nob" and took off an hour after the blast to select and release Army Signal Corps radiophotos from Camp Mercury. The Atomic Energy Commission appointed Dr. Redman to work with us in clearing the photos selected.

On the day of the big shot, we met at "News Nob" about 6 a.m., more than an hour before the troops moved in. Final arrangements were doubled-checked and the Signal Corps Photo officers headed for the troop area.

Meanwhile, at "News Nob," Sergeant Richardson set up his camera to backstop the newsreel and television media and make the official record of the blast. He was about midway up the "Nob," in an excellent position to get both distant and foreground action.

Sergeant McMahan set up near a Joshua tree in the foreground next to the MGM NEWS OF THE DAY crew and Carl Mydans of LIFE. His assignment was to get reactions of the VIP's and press, the reflection of the blast, and the shock wave which was expected some 50-55 seconds later. Our briefings had led us to expect that the shock wave might be rough enough to cause some interesting reactions.

Mr. Hargus and Mr. Lord worked with the press and pictorical media, and to prove that the Signal Corps was right on the job in communications too, a battery of teletype operators, plus some huge vans, virtually ringed the press area, ready to send out the news.

The AEC announcer on the loud speaker system explained the way the planes were coming over at 35,000 feet, the drop plane among them. At H-30, the count started—at H-5, we put on our blinders—special glasses issued by AEC. Cameramen were warned not to look in their finders during the blast and no one (if he wanted to retain his eyesight) was to try looking through field glasses until after the explosion.

The motion picture cameramen pushed buttons and watched; the still men did their preliminary sighting and then tripped their shutters. At H plus 5, we were able to resume normal sighting as the fireball started upwards from 3,500 feet and the dust cloud started rising from Ground Zero. All the cameramen kept shooting the fiery, swirling cloud doughnut ring as it spiraled upward—and the now-familiar mushroom head.

About 50 seconds later my cameramen and I turned around to make sure we were centered on the spectators for the shock wave reaction. Just as we turned, I felt a "hot breath" on my neck—somewhat like the hot air from a modern hand-drier—and received a gentle nudge which pushed me forward a foot or so. The onlookers started as the heat hit them, but nobody was toppled. Veterans of other blasts stated that the air burst did not have the same shock as a ground blast at our vantage point. Soldiers closer to

2nd Lt. A. L. Gain, 6th Army Chemical Biological Radiological School (r) uses the Geiger Counter for measuring contamination of Signal Corp photographer Cpl. A. Cohen.

Ground Zero corroborated this although they were showered with dust and got more of a shock wave than we did.

As soon as we could collect the still photos, we met the courier jeep which pulled in from the troop area some twenty minutes after the blast. On arrival at Camp Mercury, the negatives were rushed through the Signal Corps mobile lab, with the Sandia lab helping out on the drying of prints. Dr. Redman cleared them and we sent the first six to Desert Rock, the Army's camp, where a liaison plane ferried them to Las Vegas for the wire photo services.

Meanwhile, the camera units from the troop area came pouring in with their footage which we separated into two packages — documentary and newsreel-TV release. The B-25 assigned to rush the Test Command footage to the Signal Corps Photo Center was at Yucca Flats, picking up the classified film as fast as it could be gathered from the "hot" cameras within the blast area. At 2:30 p.m., April 22, I arrived at Indian Springs Air Force Base from Camp Mercury. Here the color stills and commercial newsreel-television film footage for New York were packaged and waiting. As soon as the B-25 touched ground, we jeeped out on the strip and loaded all the motion picture film aboard, taking off about 3:30 p.m. We touched down at Mitchel Field, New York, at 8:30 a.m., April 23. The newsreel and television film messengers picked up their film direct from the airplane, so their own television film was available for the afternoon and evening shows. The official Signal Corps film was rushed to the Photo Center. Because it was classified until cleared, a representative of the Atomic Energy Commission and a Security Officer from the Department of Defense, were waiting to look at the film as soon as it was developed. Mr. Nash of AEC and Major C. B. Durant were right on the job. The rolls of film were screened as fast as they came from the lab—the cleared material being turned over to film editor, George Momberg, of the Newsreel Section, OPI, for immediate editing.

While the newsreels and television film companies were editing their own film, the Department of Defense prepared the supplemental release footage. The media understood that the troop area film required clearance and more time than their own to release. By the morning of April 24, all media were serviced; the newsreels in time for their makeup of April 24; the television programs for all their headline and special programs from Thursday over the weekend.

Lt. W. R. Simmons and Cpl. W. Richardson of 301st Sig. Photo Co. aim 400 ft. Eyemo, Model Q-35 mm silent motion picture camera for the test. The camera is manufactured by Bell Howell Corp. of Chicago.

Meanwhile, back at Las Vegas, the Signal Corps delivered more radiofoto stills to Mr. Lord, who turned them over to the wire services. From the three-photo (U. S. Army Photo) spread in the *Washington Star* and many other leading newspapers throughout the country—to the national slicks and rural weeklies, you'll be seeing pictorial reverberations of the atomic blast of April 22 from now on.

Usage is the pay-off. . . . The pictorial material—newsreel, television and still—which the Army Signal Corps made for the Atomic Energy Commission and Department of Defense release, provided the maximum coverage desired. AEC and Defense on this occasion contributed in giving each of 150 million Americans a grandstand seat.

Summing up this atom-ized account of "Operation Big Shot" I can only say the entry in the book should be "PAID OFF!"

- - - — - —

View of the test site of the atomic bomb tests from the control point . . . Nothing but desert.

Born in Navy Blue was the

SPRAGUE ELECTRIC COMPANY

One of the most important component suppliers for military electronics was founded by an Annapolis graduate, who started out to improve the tone of his radio set.

Back in 1926, Lieut. Robert C. Sprague, who had done post graduate work at M. I. T. after receiving his commission from Annapolis in 1920, was one of the officers supervising the construction of the aircraft carrier U.S.S. Lexington at the Fore River Yards in Quincy, Massachusetts. Evenings Lieut. Sprague tinkered away trying to improve the tone of his radio set. But what sounded right to one person didn't suit another. A "tone control" was needed and Lieut. Sprague proceeded to invent one. It consisted of a series of condensers and a tap switch, which was plugged between the speaker jack and the separate horn loud speakers then used. Since mica condensers were quite large and expensive, Lieut. Sprague designed a tapped paper condenser for the purpose.

And so the Sprague Specialties Company was incorporated on June 1, 1926 to exploit the tone control. The sale of stock to a few friends and the founder's savings provided the company's modest capital. Materials were procured but the company from whom condensers were ordered failed to deliver, so Lieut. Sprague had to make the required special units.

To make the story short, the tone control venture wasn't commercially successful, resulting in a loss of about one-half the company's resources. The younger brother of the founder, Julian K. Sprague, who had just joined the company, suggested that there should be a market for a small paper condenser using the general manufacturing technique developed for the tone control condenser and which permitted it to stand the unusually high (at that time) test voltage of 1500 volts D-C for a two-paper condenser. Such a unit was designed which was called a 'Midget'® condenser.

BIRTHPLACE OF SPRAGUE ELECTRIC

In the kitchen of a two-family house in Quincy, Mass., were made the first Sprague capacitors for the tone control. Paraffin from the corner grocery store was the impregnant.

The new 'Midget' condenser was an immediate success and the Sprague operation mushroomed with the growing radio industry. Within two years several hundred people were employed in sixteen thousand feet of space in a Quincy office building. During this time Robert Sprague spent his week days assisting in the design of the Lexington and his nights and week ends guiding the destiny of the up and coming new enterprise, while Julian Sprague doubled in brass as Production Manager and Purchasing Agent.

In 1928 Lieut. Sprague resigned his commission in the Navy to devote his full time to the growing business and by the next year 500 people were on the payroll and there was no further space for expansion in Quincy. In 1930, the young company moved to its present home in the northern Berkshire city of North Adams, where an abandoned textile mill offered suitable quarters of 160,000 square feet and an adequate supply of labor. Sprague now occupies two other plants in North Adams as well, with a total floor area of over 1,200,000 square feet. In addition, the company, its subsidiaries and affiliates have plants in Bennington and Barre, Vermont; Nashua, New Hampshire; Saugerties and Kingston, New York; and Milwaukee, Wisconsin.

The first 'Midget' condenser was sold in December, 1926. The billionth Sprague capacitor came off the lines in April, 1948. The Sprague Electric Company (the name was changed in 1944) produces today in three hours as many units as were produced in its entire first year of business. Besides capacitors, Sprague's present staff of over five thousand employes manufacture resistors, radio interference filters, pulse-forming networks, printed circuits, and high-temperature magnet wire. And a substantial portion of the components manufactured today are for military use.

Sprague's record in World War II was unusual. In the early days of the war the company made some gas masks and incendiary bomb assemblies for the Army but dropped out of this work as the pressure for premium quality capacitors and resistors increased. Concentration on the adaptation and improvement of their regular products for military purposes led to many important developments including metal glass-sealed power resistors, first to meet the Bureau of Ships Grade 1, Class 1 requirements; Prokar miniature molded capacitors for fuzes, the first to use a polymer impregnant; Vitamin Q high voltage capacitors which made possible the manufacturer of important airforce equipment which could not otherwise have been built, and ceramic-coated magnet wire for operation at hot-spot temperatures up to 250°C. These contributed to Sprague receiving five Army-Navy E Awards, as well as the Navy Bureau of Ordnance "E" for excellence of work in supplying capacitors for VT fuzes.

Since World War II additional developments of prime importance have further strengthened Sprague's position. These include a high quality line of phenolic molded tubular condensers which have set new standards in radio, TV, and other end equipment, and have important military potentialities; and a complete line of super-JAN subminiature, hermetically sealed metal tubulars which are available for operation to 125°C and which have become the present-day military standard.

Well over one hundred fifty engineers, physicists, chemists and technicians are today working on new Sprague developments, some of which are sponsored by United States Government agencies. This top talent is backed up by a completely separate group of engineers on production engineering, specifications and quality control. The Sprague Electric Company believes that basic research and engineering, backed up by adequate highly-trained application engineering, is the life blood of its business and that maintaining its preeminence in this field is necessary to its continued leadership.

Its laboratories occupy over fifty thousand square feet of space and are considered the best equipped of their kind.

NESTLED IN THE BERKSHIRE HILLS

This is the Massachusetts border town of North Adams, where the Sprague Electric Company has its headquarters. The rural atmosphere comes practically to the factory doors.

COMPONENT RESEARCH STARTS HERE

The chemistry laboratory is where new materials and processing techniques must begin. And this is a typical view of a typical laboratory in Sprague's Research and Engineering Building.

TRYING OUT A NEW MATERIAL

This Sprague engineer is casing capacitors in an experimental test housing. Of many materials which are developed, only a few prove commercially successful and are placed in production.

MIDGET vs. JAN

Robert C. Sprague, president of the Sprague Electric Company, compares a 1926 Midget ® waxpaper capacitor with examples of 1952 hermetically-sealed oil-filled metal-encased paper capacitors to military specification JAN-C-25. Sprague is one of the largest suppliers of these capacitors.

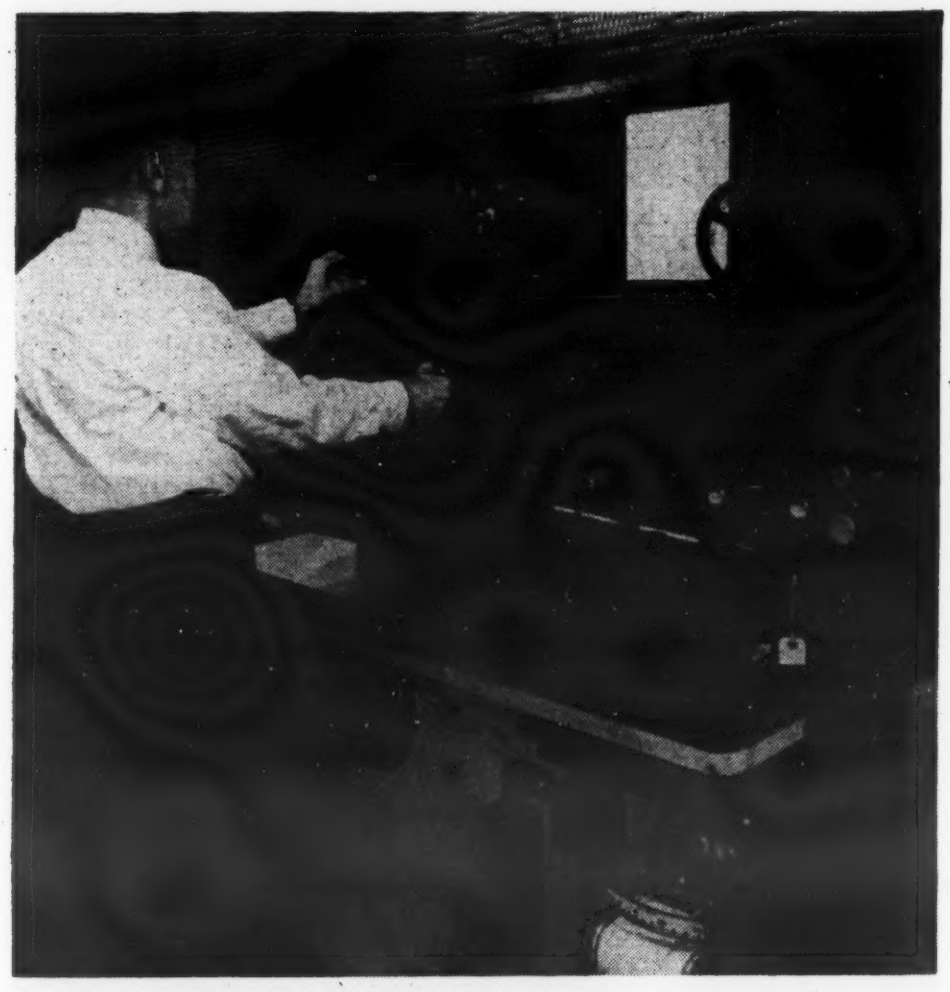
SPRAGUE ELECTRIC COMPANY (CONTINUED)

TOWARD BETTER CERAMIC DIELECTRICS

This technician is removing sample ceramic capacitor bodies from a constant gradient temperature furnace. A concerted research program on better ceramics is underway both at North Adams and at the Herlec Corp. division in Milwaukee.

LIFE TEST POWER PANEL

Laboratory testing and evaluation of new capacitor designs as well as constant quality control of production can only be accomplished by stringent accelerated life tests. This power supply furnishes the necessary voltages for a bank of high temperature test ovens.



HIGH VOLTAGE SCHERING BRIDGE

This equipment, one of several owned by Sprague, permits measurement of capacitor characteristics under operating potentials up to 10 KV, 60 cy. Among other uncommon equipment in Sprague's laboratories is an electron microscope and X-ray diffraction apparatus.

TESTING NEW DESIGNS

Here a Sprague development engineer is checking the characteristics of a pulse-forming network for a radar equipment. Specialized apparatus of this type is prominent throughout Sprague laboratories.

MOSTLY FOR THE SERVICES

Production of Ceroc High Temperature Magnet Wires from Sprague's Bennington, Vt. plant is almost wholly for military end uses at present.

PROCESS CONTROL

This is a typical quality control cubicle, many of which are scattered through Sprague manufacturing operations where required. In this photo, the control technician is testing formed electrolytic capacitor foil.

WINDING SUBMINIATURES

In this section of the Winding Department at Sprague's Nashua, N. H. plant, are being rolled the sections for Vitamin Q® subminiature paper capacitors, which are playing such an important part in military electronics from fuzes to radar to auto-pilots. These capacitors are not only smaller than comparable JAN units, but operate at temperatures up to 125°C and have better electrical characteristics. Sprague's preeminence in this field is due largely to the pioneering of Vice-President Julian K. Sprague, who has made military requirements his personal "baby."

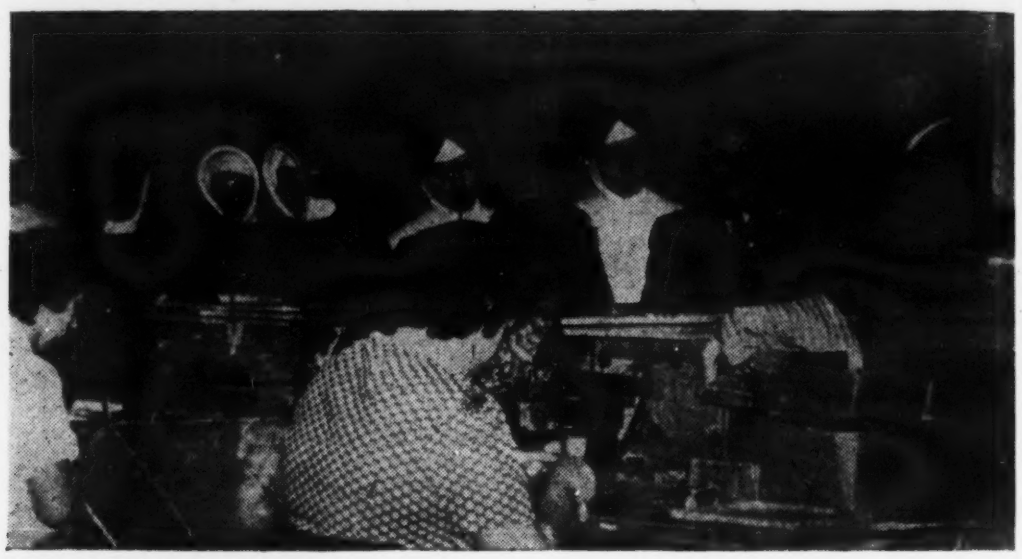
SPRAGUE (CONTINUED)

NOISE PROBLEMS SOLVED

Elimination and suppression of radio and electronic interference is a major problem in equipment design today. Here a Sprague engineer is testing an actuator motor for r-f interference.

TOP BRASS

Here is the Sprague Management Team. Left to right, Vice-President Julian K. Sprague (sales), Vice-President Ernest L. Ward (manufacturing), President Robert C. Sprague, Vice-President Preston Robinson (research and engineering), and Treasurer George B. Flood. Company Secretary and General Counsel William J. Nolan was away when this picture was taken for *Signal*.



COMMUNITY RELATIONS

Here a group of visitors at an Open House for North Adams teachers and clergy are on a guided tour through one of the Sprague plants. An Open House for employes' families is held in alternate years as part of an extensive community good will program.

TESTING, TESTING, TESTING, TESTING . . .

These operators in a North Adams assembly line for television Twist-Lok electrolytics check every capacitor section for conformance to electrical standards. Thorough testing and check inspection is almost a Sprague fetish.

HERE ARE 543 different Sprague components. Procurement of materials and scheduling of production is, of course, a major problem since last year Sprague manufactured products to some twenty thousand specifications. The value of these products totalled nearly forty million dollars.

By - Lt. Col. A. K. Ransom

DOING IT THE HARD WAY

In our last issue we presented a brief description of the ROTO-SPANDULATOR which 217 alert readers with long memories identified correctly as the Alexanderson Alternator. *Turn to page 78 for some of the replies.*

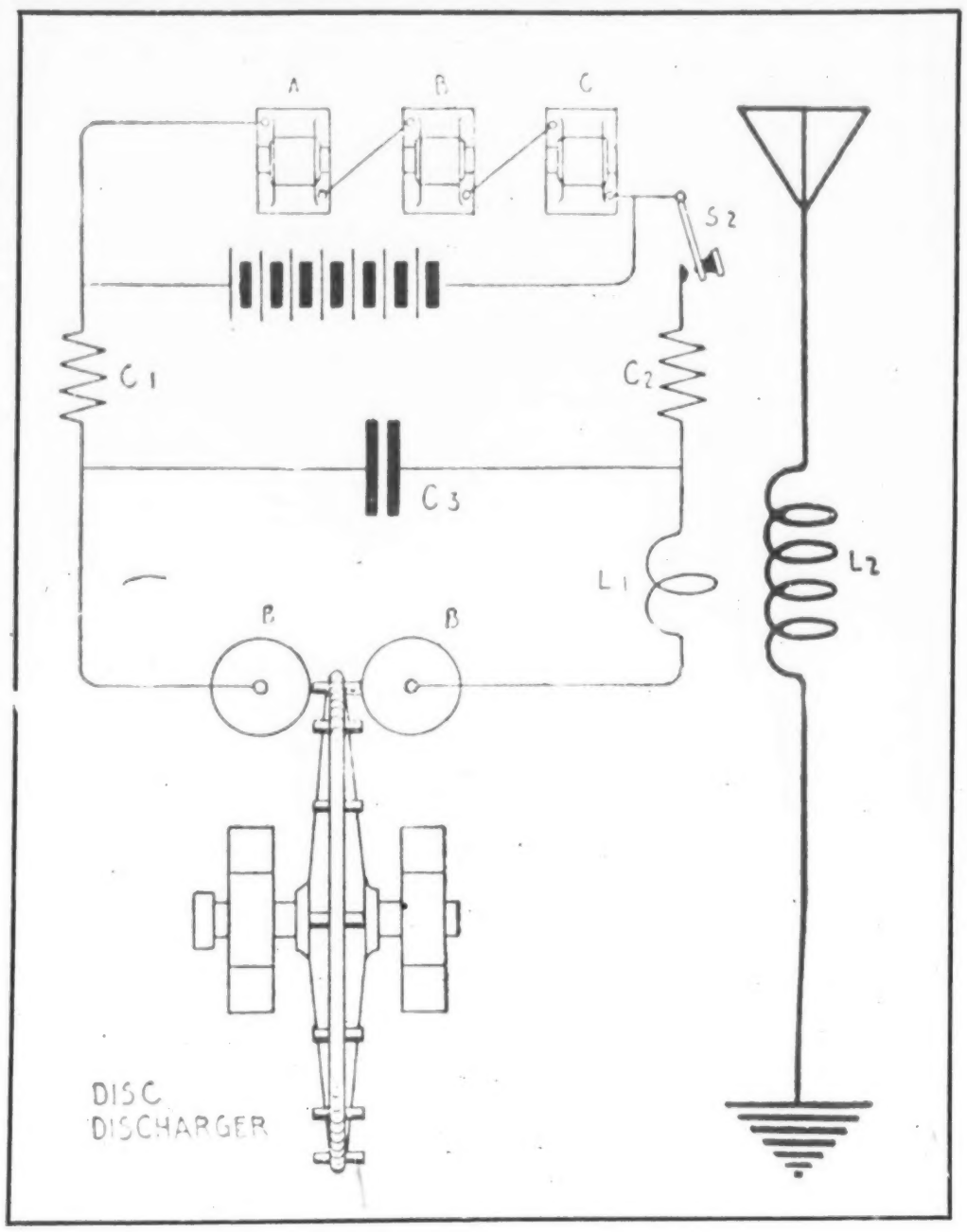
Installations of this type were not uncommon and the writer recalls with some nostalgia the 12:20 A.M. schedules of station WII at Bound Brook, N. J., when such an alternator broadcast paid press to ships at sea.

Another type of transmitter was used during the period just prior to World War I and established a reputation for dependable, long distance, point to point communication.

In these installations, the condensers were charged by 14,000 volts direct current, the source of which was a *battery of 6,000 storage cells* connected in series. These batteries in turn were charged by three 5,000-volt generators connected in series.

As will be seen from the diagram, the energy stored up in the condenser C-3 was discharged through the usual oscillation transformer and *a studded disc discharger.*

This discharger consisted of a large steel disc several feet in diameter, with sparking electrodes mounted thereon and which pass closely to the fixed electrodes B, B.



The electrodes B, B, in reality revolved slowly, and therefore presented constantly cooled surfaces to the path of the spark discharge. Protective chokes C-1 and C-2 protected the generator from the discharge of the condenser.

The principal advantage of the disc discharger was the *quenching* effect obtained when the disc discharger was driven at a certain velocity. This prevented the re-transference of energy to the spark gap circuit, and in consequence, the antenna oscillations *had a decrement as low as .03 per complete cycle.* In addition a spark or group note of distinct musical pitch was obtained which was extremely desirable for aural reception through atmospheric electricity.

The *high potential* condensers were of unusual construction and dimensions. Consisting of a number of large steel plates suspended from the ceiling on special insulators, they were separated sufficiently to prevent the spark discharging between plates, and the required capacity was found by connecting a large number of such plates in parallel.

Beyond the size of this condenser, the *oscillation transformer* was of interest, principally because of its dimensions. The primary winding had but two turns, consisting of a specially constructed cable, one foot in diameter. Owing to the large amounts of power used, a cable of these dimensions was positively required, and good surface conductivity was among the chief considerations.

Signalling was not effected by interruption of the primary circuit as in small-sized transmitters. In these sets, specially constructed high voltage relay switches (S-2), in turn controlled by a small telegraph key and source of D. C. current, interrupted the high voltage circuit from the battery to the condenser. Arcing was prevented by forcing an extra heavy air blast on the contact points by specially designed motor blowers.

The receiving apparatus consisted of a *balanced crystal receiver,* employing either *carborundum rectifier,* or Fleming valves. Through a set of microphonic relays, connected in cascade, the signals were amplified considerably and either deciphered in ordinary ear telephones or by indenting the pulsations on the wax records of a dictaphone.

EDITOR'S NOTE:

Our records indicate the existence of two such stations engaged in handling commercial traffic in 1917. Do you remember where?

Drop a card to Dept. X, c/o Signals and be sure to watch next issue for the tally and Col. Ransom's next challenge.

• • •

Last minute word from Colonel Ransom as SIGNAL went to press tells us of his overseas assignment. He will spend a year with the Turkish Army in the field. His address: TUSAG-JAMMAT; APO 206A, NY.

SPRAGUE (CONTINUED)

NOISE PROBLEMS SOLVED

Elimination and suppression of radio and electronic interference is a major problem in equipment design today. Here a Sprague engineer is testing an actuator motor for r-f interference.

TOP BRASS

Here is the Sprague Management Team. Left to right, Vice-President Julian K. Sprague (sales), Vice-President Ernest L. Ward (manufacturing), President Robert C. Sprague, Vice-President Preston Robinson (research and engineering), and Treasurer George B. Flood. Company Secretary and General Counsel William J. Nolan was away when this picture was taken for *Signal*.

COMMUNITY RELATIONS

Here a group of visitors at an Open House for North Adams teachers and clergy are on a guided tour through one of the Sprague plants. An Open House for employes' families is held in alternate years as part of an extensive community good will program.

TESTING, TESTING, TESTING, TESTING . . .

These operators in a North Adams assembly line for television Twist-Lok electrolytics check every capacitor section for conformance to electrical standards. Thorough testing and check inspection is almost a Sprague fetish.

HERE ARE 543 different Sprague components. Procurement of materials and scheduling of production is, of course, a major problem since last year Sprague manufactured products to some twenty thousand specifications. The value of these products totalled nearly forty million dollars.

right, Vice-
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By-Gt. Col. A.K. Ransom

DOING IT THE HARD WAY

In our last issue we presented a brief description of the ROTO-SPANDULATOR which 217 alert readers with long memories identified correctly as the Alexanderson Alternator. *Turn to page 78 for some of the replies.*

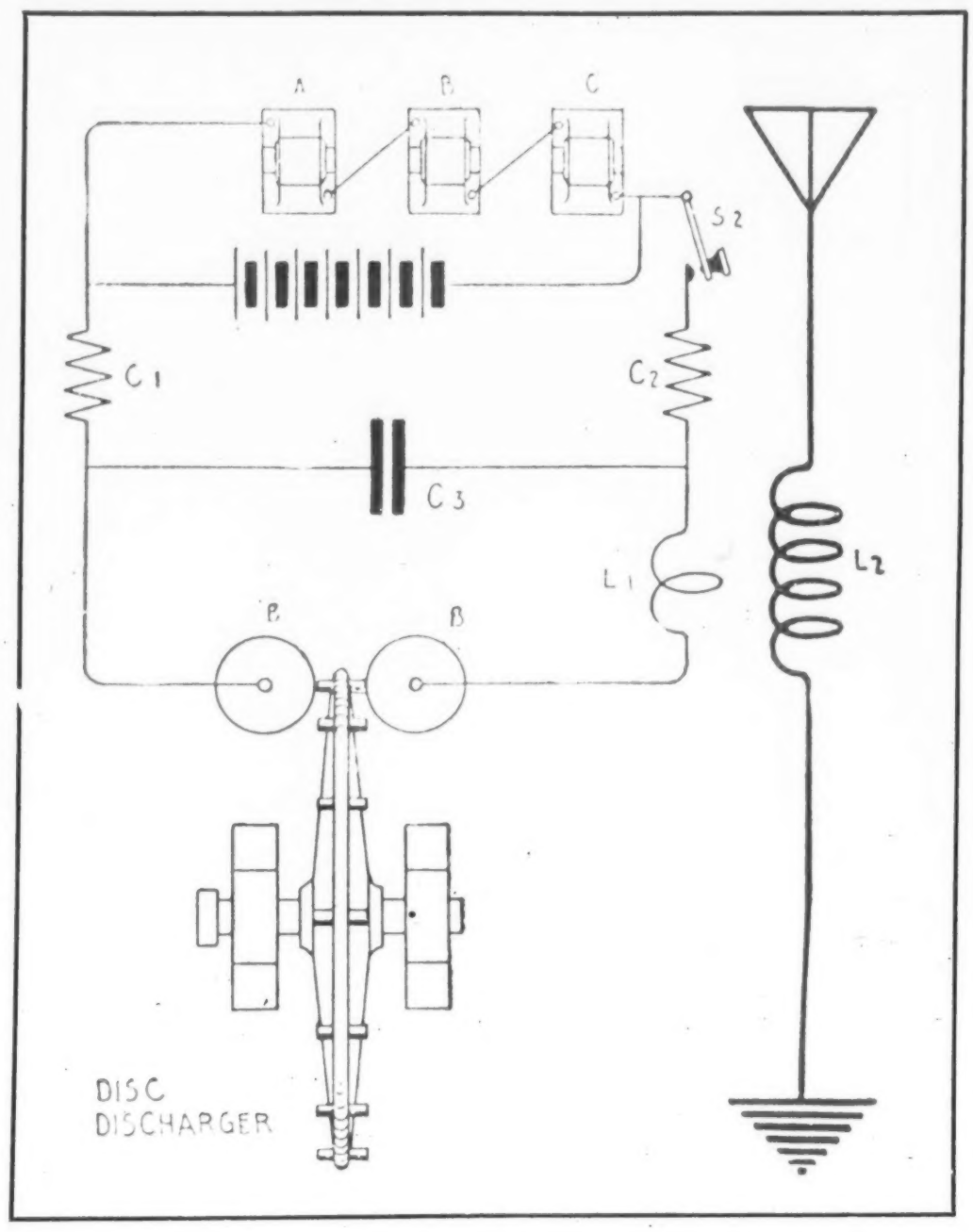
Installations of this type were not uncommon and the writer recalls with some nostalgia the 12:20 A.M. schedules of station WII at Bound Brook, N. J., when such an alternator broadcast paid press to ships at sea.

Another type of transmitter was used during the period just prior to World War I and established a reputation for dependable, long distance, point to point communication.

In these installations, the condensers were charged by 14,000 volts direct current, the source of which was a *battery of 6,000 storage cells* connected in series. These batteries in turn were charged by three 5,000-volt generators connected in series.

As will be seen from the diagram, the energy stored up in the condenser C-3 was discharged through the usual oscillation transformer and *a studded disc discharger.*

This discharger consisted of a large steel disc several feet in diameter, with sparking electrodes mounted thereon and which pass closely to the fixed electrodes B, B.



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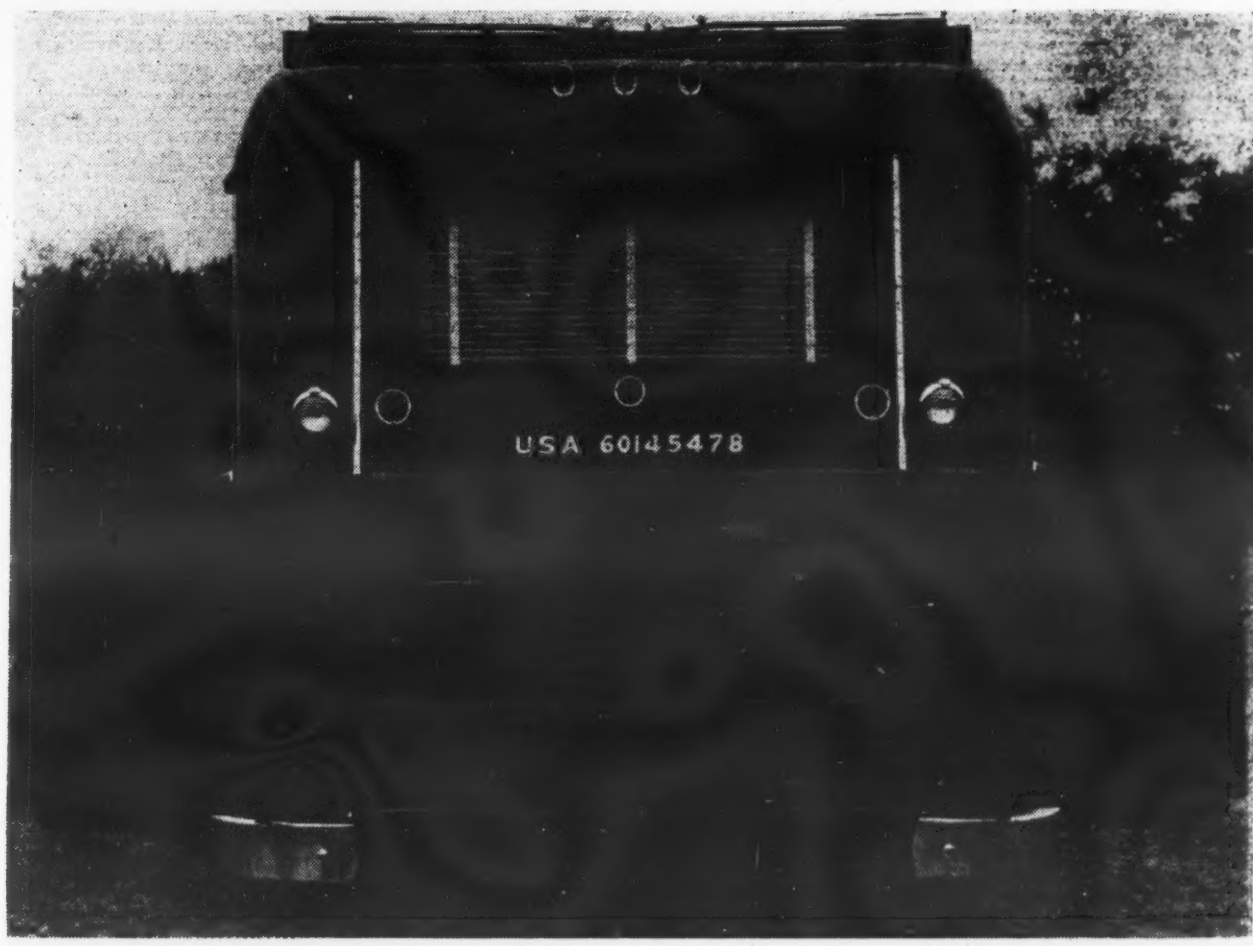
Mobile TV Sys

Unit No. 1—Pickup and Transmittin vehicle. Provision is made to operat all equipment in this vehicle on 20 volt, three-phase power, which ma be supplied from Unit No. 2 or fro a commercial source, or on 120-vol single-phase power, supplied from commercial source.



Right: Rear of Unit No. 1 showing camera and microphone cables and reels; Microphone and commercial program sound line connections; and six 120 volt utility outlets.

By: R. B. LeVino
Chief, TV Equipment Section
Wire Communications Branch
Coles Signal Laboratory, Ft. Monmouth, N. J.

Vehicles forming the Mobile TV System.

The Army's new mobile television system, under operational control of the Army Pictorial Service Division, will be used to explore the feasibility of employing television for field instruction and to develop instructional techniques using television. Although the system has not been designed as tactical military equipment, it is intended that it will serve to stimulate the tactical employment of television. The equipment is expected to be of value in televising intricate field exercises and in transmitting the pictures to expert observers, maneuver umpires and the like, and to military classrooms.

Four vehicles comprise the system and are shown above. It will not be used directly for television broadcasts as such; programs picked up in the field will be transmitted over a "closed" circuit to military viewers or to a commercial broadcasting station by microwave radio link and/or coaxial cable.

Initial System

This system, which is regarded as a "First" in its field, provides mobile, self-powered facilities for technically controlling an integrated television military production, including the output of three cameras and sound originating at microphones or recorder-reproducers. It also provides for radio-relaying the video and audio signals to a distant point which may be five or ten miles away. There they are monitored and amplified and, in optional combination with video and audio signals originating on film, slides or recorder-reproducers at that point, are displayed to audiences on direct-view receivers and a large-screen projection receiver.

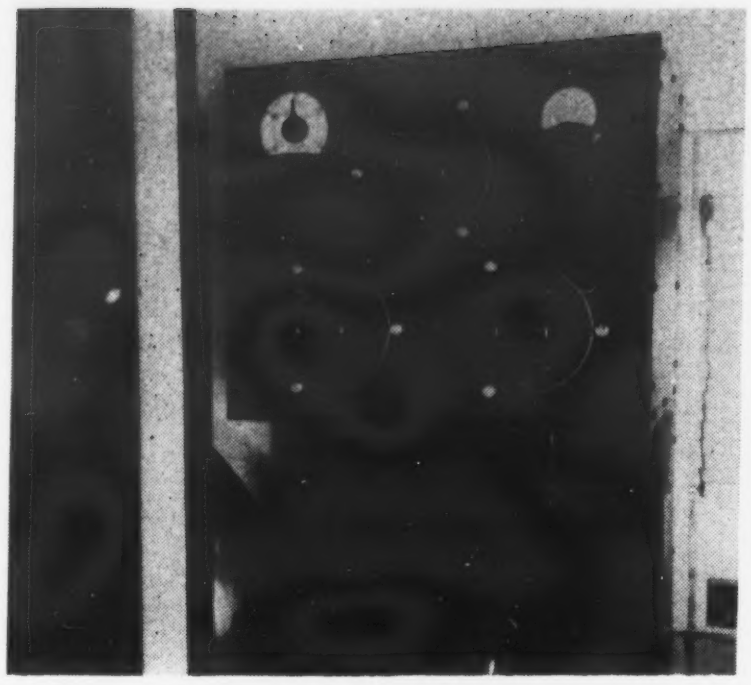
Requirements and specifications covering the design of the vehicles and equipments were prepared by the Signal Corps Engineering Laboratories, Fort Monmouth, New Jersey, after consultation with representatives of the Television Equipment Manufacturing and Broadcasting Industries.

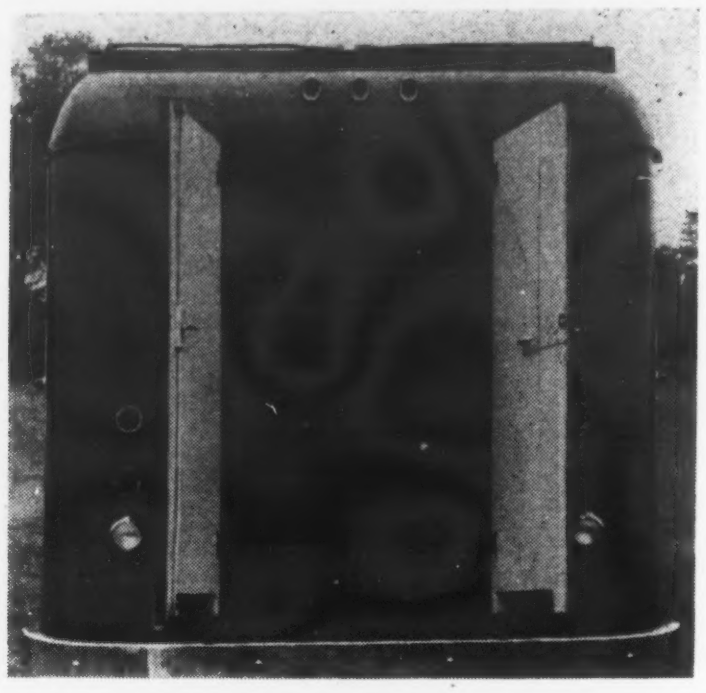
In designing this mobile system, every effort was made to develop a flexible, versatile arrangement of system components, with suitable protection being provided against shutdown due to equipment or power failure. Reserve and alternate equipments are available; engine-generator units supply 100% more 120-volt, 3-phase power than is required for the complete system when all equipment is activated; lighting systems and radio intercommunication facilities are arranged for fall-back to vehicular battery power supply; and complete maintenance facilities are provided for vehicles and equipments including laboratory test gear, tools, workbenches, spare parts, and tubes.

Consideration was also given to comfort of operating personnel. All vehicle walls, floors, and ceilings are insulated; bus-type seats are provided for transportation of personnel; exhaust ventilating and circulating fans are installed in each vehicle; a comfortable light level is maintained by the use of diffusion-type lighting fixtures on ceilings and an interior finish which is egg shell marlite on ceilings and upper walls, light green marlite on lower walls; floors are covered with heavy battleship linoleum; windows are equipped with sliding sash and venetian blinds; and tandem rear wheels and shock absorbers provide unusually stable riding qualities for this type vehicle.

Each unit is 31 feet long and 8 feet wide with a gross weight of approximately 12 tons. An under-cab, Hercules 135 HP motor applies power through a linn front-wheel drive permitting road speeds in excess of 50 miles per hour on smooth highways. In addition to required marker and stop lights, reflectors, etc., each vehicle is equipped with back-up lights, directional signals, parking lights, and a spotlight. Fluted stainless steel on the upper portions of the vehicles, Signal Corps medallions, chromium rub rails, wheel caps, and molding impart a modern streamlined appearance. Each vehicle is equipped with 10-pound CO2 fire extinguishers, luggage compartment, tire chains, automotive tool set, spare tire and wheel, and highway warning kit. Spare parts for vehicle motors and engine-generator power units are carried in units Nos. 2 and 4. The bus-type seating provided in each vehicle makes possible the transportation of a total of 18 operating personnel in addition to the four drivers. If use is made of the chairs located at operator's positions in units Nos. 1 and 3, six more personnel may be transported. Since one radio intercom transceiver in each vehicle may be operated from the vehicle storage battery, all units are in communication with each other when on the road.

Details of the facilities provided and equipment characteristics in each vehicle are as follows:





Left: Voltage regulator panel in Unit No. 1.

Right: Rear view of Unit No. 3 showing receiving relay dish mounted for transportation. Video-Audio outlets are located behind left-hand door, 120-Volt A-C outlets behind right-hand door.

UNIT NO. 1—PICKUP AND TRANSMITTING VEHICLE

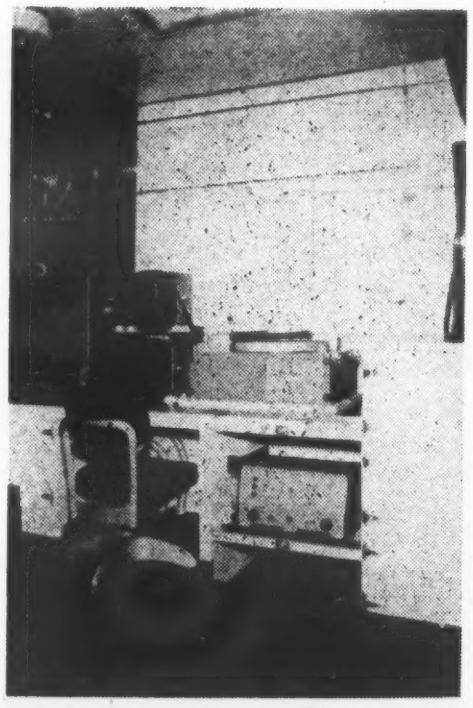
Provision is made to operate all equipment in this vehicle on 208-volt, three-phase power, which may be supplied from Unit No. 2 or from a commercial source. or on 120-volt, single-phase power, supplied from a commercial source. Equipments are fed from 10 circuits protected by circuit breakers and arranged to provide approximate equal phase loading on the three-phase supply. Voltage unbalance and voltage drop in supply cables may be corrected by means of powerstat regulators and voltmeter.

Video pick-up equipment includes a standard RCA field triple-camera chain with customary control, monitoring and switching facilities arranged at an operating console to the rear of the vehicle and shock-mounted on grant pulley slides so that the entire chain may be removed from the vehicle for set-up elsewhere. Provisions are made for lab dissolve, fading, and superimposition of camera outputs. Immediately below and to the rear of the console are located cables and reels with payout through rear double doors, which permit locating all three cameras, each 250 feet from the vehicle, or one camera 750 feet from the vehicle. The double doors are fitted with rubber flaps to permit closure when cables are unreeled. Cameras (which are fitted with running time meters) and view finders are shock-mounted in compartments in the vehicle when not in use. Lenses are carried in fitted boxes, and tripods, friction heads, and collapsible dollies, for studio operation, field use, or on the roof of the vehicle, are stowed in specially designed compartments.

Audio equipment includes polydirectional, pressure, and lapel type microphones, a parabolic reflector, and an appropriate assortment of floor, portable tripod, boom, and desk stands. Cables which permit locating any three microphones 250 feet from the vehicle or one microphone 750 feet from the vehicle are wound on a reel at the rear. Facilities provided at the audio operator's position, shown in A below include (Left to Right) control units for two 11-watt "order wire" transceivers (CMV-1A) operating at 163.525 and 173.525 megacycles; a studio-type magnetic tape recorder, reproducer (RT-11A) with audio patch panel immediately below; an OP-6 pick-up amplifier, an OP-7 preamplifier mixer; a disc recorder-reproducer (OR-1A); monitor amplifier and monitor speaker. Not shown are portable, twin loudspeakers, which may be employed for public-address purposes, and an additional OP-6 and OP-7. An announcer's or producer's desk is provided in the cab portion of the vehicle B below equipped with a 12" TV line monitor, announce microphone, and intercom headset, and access may be made at this point, by means of the switch panel shown, to the "producer's private line" intercom circuit and hence to the radio "order-wire" circuit to the receiver display unit. Connectors at the rear of the vehicle permit convenient connection of eight microphones and two commercial program sound lines to the audio patch panel.

The intercom circuits of the TS-30A video field switcher are modified to permit connection, through the audio patch panel, of the "producer's private line" and "engineering private line" to the two order wire transceivers on a switch-to-talk basis. This permits intercommunication between the camera operators, camera control operators, technical director, floor director, and announcer at Unit No. 1 and personnel at distribution console in Unit No. 3 Connections to the Audio Patch Panel make it possible to substitute the 163.252 mega-

A



B

C

A. Audio operator's position in Unit No. 1.

B. Announcer's desk in Unit No. 1.

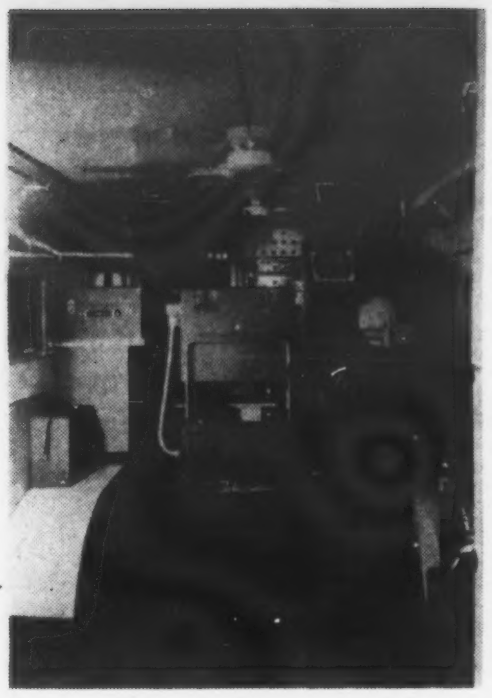
C. Interior view to rear of Unit No. 1 showing Video Console; Audio Operator's position on right; Video and FM sound transmitters in cabinet to left.

A. Interior view of Unit No. 2 from rear showing maintenance area, cabinets and cable reels.

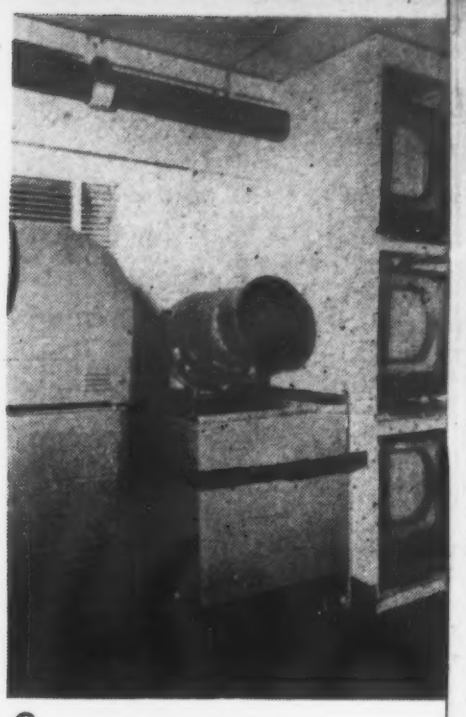
B. Interior view to rear of Unit No. 3—Receiving and distribution console in rear, film and slide projector in foreground.

C. Interior view of Unit No. 4 toward rear, showing maintenance area, cabinets and roadside cable reels. Right: Video operating console in Unit No. 1.

A



B



C

cycle "order wire" circuit for the FM program sound circuit should the latter fail. The Audio System includes suitable pads and switching facilities, by means of patching panels, so that the audio operator may ride levels on eight sources of program sound (Microphones, disc or tape recorder-reproducers); record program sound on disc or tape recorders; switch program sound to FM transmitter or commercial sound lines; and operate the PA system with sound originating at announcer's or external microphones or the disc or tape recorder-reproducers.

Video signals are transmitted to the receiver display unit from a TTR-1 microwave relay transmitter operating at 7125 megacycles. Various lengths of cable carried in units Nos. 1 and 2 permit locating the transmitter "dish," with tripod, on the roof of the vehicle or at any point up to 500 feet from the vehicle, and a ring mount is provided so that the antenna may be attached to buildings or towers. The 45-watt, frequency modulated, program sound transmitter, operating at 148.950 megacycles, is modified to provide audio quality equal to broadcast standards, and the antenna reflector and director elements may be plugged in roof sockets in a "Y" configuration to provide an optimum pattern in any one of 12 directions. Whip antennas for the two order-wire transceivers are permanently mounted on the rear of the roof. The relay transmitter control and sound transmitter are located in a cabinet, seen to the left in Figure 10, behind which the microwave "dish" is mounted for transit. Two "Handie-Talkie" radio sets are carried for communication between operating personnel in setting up equipments.

Access to the roof, which is of tread-plate construction, coated with nonskid paint, is through a hatch; a magnesium collapsible ladder is stowed in the laggage compartment under the cab floor. The roof safety railings, seen on page 18, fold down and are secured to the roof when not in use. Four tie-down rings in the roof and special adjustable tie-down rigs, designed at Signal Corps Engineering Laboratories, serve to hold camera and microwave transmitter tripods securely in position. Four stabilizing jacks, permanently attached to the chassis, prevent personnel movement within the vehicle or on the roof from disturbing camera operations when mounted on the roof. Lightweight, upholstered swivel chairs, three at the video console and one at the Audio operator's position, may be locked to the floor to prevent movement when the vehicle is in motion.

UNIT NO. 2—TRANSMITTING POWER SUPPLY VEHICLE

Two 15 KVA, 4-wire, 208/120-volt, 3-phase, 60-cycle gasoline-driven generators (ONAN 15HK-4R), are mounted transversely in the vehicle with an operating aisle between. Access doors are located in the vehicle at each end of the power units to provide increased ventilation when operating in very high ambient temperatures and to permit removal and/or replacement of the units. Adjustable louvres in the roadside access doors

Left: Maintenance area, cabinets and roadside cable reels of Unit No. 4. Right: Video operating console—Unit No. 1.

permit doors to be closed in inclement weather. Each unit is equipped with a governor, voltage control, running time meter, hi-temperature cutoff, voltmeter and ammeter, and a frequency meter is connected to the output of the unit supplying "TV Power." Two 100-ampere change-over switches permit connecting either generator to a "TV Power" outlet (for supply to Unit No. 1) or "lighting" outlet (for supply to portable lighting equipment) located on the curb side of the vehicle. A multi-breaker panel controls power to the vehicle lights, utility outlets, ventilating fans, and converter for the CMV-1A transceiver, and a changeover switch permits energizing these equipments from a commercial source through a roadside connector and cable when the engine-generator units are inoperative. The power unit compartment is lined with steel-covered plywood to reduce fire hazards.

Portable studio lighting equipment, which includes Color-Tran Converter Company spot and flood kits, is carried in the vehicle. Seven hundred fifty feet of cable for power supply to the lighting equipment, 500 feet of microwave transmitter cable, and 250 feet of cable for transmission of 3-phase power to unit No. 1, are carried on reels in the rear quarter of the vehicle, and hinged cable ports permit unreeling and reeling of these cables through the road and curb sides of the vehicle. Six 120-volt, 60-ampere utility outlets, located in the outside reel compartment, make the full output of either power unit available for emergency power supply for purposes other than for the TV system.

Workbench area totals 15 square feet, and felt-lined and drawer-type cabinets provide over 130 cubic feet of storage space for spare parts, tools, tubes, test equipment, etc. Tubes are individually carried in specially designed shock-proofed compartments, and spare parts drawers are indexed by the major equipment components carried in unit No. 1 test equipment includes: two WO-79B oscilloscopes, two vacuum-tube voltmeters, one battery-operated voltohmmeter, one video sweep generator, one tube tester, one capacitor tester, one plate current meter, and a RMA test chart. A tank-type vacuum cleaner is provided for cleaning all electronic gear.

The CMV-1A transceiver and control unit, employed for communication with the other vehicles of the system, are mounted in the cab. Two "Handie-Talkie" radio sets are carried for communication between operating personnel in setting up equipments.

UNIT NO. 3—RECEIVER-DISPLAY VEHICLE

Provision is made to operate all equipment in this vehicle on 208-volt, three-phase power, which may be supplied from Unit No. 4 or from a commercial source. Equipments are fed from 10 circuits protected by circuit breakers and arranged to provide approximate equal phase loading on the three-phase supply. As in Unit No. 1, powerstat regulators, mounted to the left of the receiving and distribution console, permit correction of voltage unbalance or voltage drop in supply cables.

The video and program sound receiving and distributing equipments are located on racks at a control console at the rear of the vehicle. Mounted at this location are: the control for the microwave relay receiver, the FM program sound receiver, a grating generator, three TA-1A video distribution amplifiers, three WP 33B power supplies, video switching panel (TS-1A), two video jack panels, VU meter, two audio jack panels, film master monitor and camera control console, 12" video utility monitor and control units for the two 12-Watt "order-wire" transceivers. A monitor speaker is mounted on the wall to the right of the control console, and an OR-1A disc recorder-reproducer and amplifier (which may be used for pre-program sound), and two 580C power supplies are mounted on the wall to the left of the console. The SYNC generating equipments for the film and slide projector are located above the wheel housing to the right of the console.

The video switching panel permits instantaneous switching, by "punching up," of any one of six inputs (such as the output of the microwave receiver or the film and slide projector) to one or both of two output circuits (the direct-view receivers, and the receiver-projector). The video monitor may be separately "punched up" to preview or monitor any of the six inputs. An audio relay switching unit, operated by contacts on the video switching buttons, provides simultaneous switching of video and associated audio to the two output circuits; simultaneous "previewing" of audio and video with the respective monitors; or switching of other audio (disc recorder-reproducer output or console microphone) to the two output circuits.

The ten direct-view receivers and receiver-projector are supplied with video-audio signals and 120-volt A-C power via outlets in the rear of the vehicle and by cables, carried in Unit No. 4, which permit operation of each of the receivers up to 500 feet from unit No. 3. Auto-transformers provided in the circuits ahead of the A-C outlets increase the line voltage to approximately 130 volts to compensate for drop in the distribution cables. The RCA 16 MM film and slide projector, multiplexer unit, and camera are mounted midway in the vehicle, and the TLS-86 projector-receiver (modified with a "line-air" switch), speaker, and portable screen are carried adjacent to the film and slide projector. The ten direct-view 16" receivers are modified to include an additional stage of video amplification and a "line-air" switch, and are shockmounted on wooden platforms that slide on roller bearings fitted in the storage compartments. Ten specially designed collapsible wheeled dollies are carried in a compartment in the receiver storage area. When unfolded, the dolly accommodates the wooden platform upon which the receiver is shockmounted, placing the receiver at a height convenient for viewing from a seated position.

Video signals are received from Unit No. 1 by a TRR-1A microwave relay receiver. Various lengths of cable, carried in units Nos. 3 and 4, permit locating the receiver "dish," with tripod, on the roof of the vehicle or at any point up to 500 feet from the vehicle, and a ring mount permits attachment of the antenna to buildings or towers. The antenna elements of the FM program sound receiver may be arranged for optimum receiving gain in the same fashion as the FM transmitting antenna is aligned for optimum field pattern on Unit No. 1. Two whip antennas for the order-wire transceivers are permanently mounted on the rear of the roof. Six "Handie-Talkie" radio sets are carried for communication between operating personnel in setting up the display equipment.

As in Unit No. 1, access to the roof is through a hatch; a magnesium collapsible ladder is stowed in the interior of the vehicle. Roof safety railings, tie-down rings and vehicle stabilizing jacks, to prevent movement of the film camera, are identical with those provided for Unit No. 1. Two swivel chairs located at the distribution console, may be locked to the floor to prevent movement when the vehicle is in motion.

UNIT NO. 4—RECEIVER-DISPLAY POWER SUPPLY VEHICLE

One 15 KVA engine-generator unit, identical with the

(*Continued on page 76, col. 1*)

JCEC

what it means——

what it does

• Address by Adm. John R. Redman, Director, Joint Communication Electronics Committee, before AFCA Boston Chapter.

IT gives me great pleasure to be privileged to address the Boston Chapter of the Armed Forces Communications Association this evening. Perhaps I can best convey to you my attitude toward the Association by pointing out that my certificate of Honorary Membership, suitably framed, hangs in a prominent position on the wall of my office in the Pentagon.

My interest in the Association stems not only from my professional work in communications-electronics, but also from my hobby, photography. Perhaps my thought is more eloquently expressed in the statement on the front page of our news letter by stating in part—"The Armed Forces Communications Association is a patriotic, educational, and non-profit society of American citizens dedicated to military, scientific and individual preparedness." I consider myself well qualified for membership under this definition with one notable exception—I am not a scientist. I am well aware of the pitfalls into which I could step if I were to pose as a technical expert. I do feel, however, that my experience and background in the field of joint communications-electronics qualifies me to discuss this subject with you tonight. I know that most of you have been following military communications-electronics problems, and I would like to try this evening to bring you up to date on what progress has been made in joint communications-electronics.

I have used the term "Joint Communications-Electronics" several times. We see the term more and more in print and hear it in conversation. Now suppose we consider for a few minutes what we mean by this term.

Apropos of one man's idea of what it means, is an incident that occurred during the last war. It is a true story.

Early in 1944, the then Chief Signal Officer of the Army, Major General Harry C. Ingles, went on a very extensive inspection trip of signal installations and troops throughout the Pacific Theaters. Not long before that time, a series of base joint communications centers had been established at critical points in the Pacific where air, ground and naval activities were operating in the same relatively confined area. During his trip, General Ingles made several stops enroute to inspect base signal installations on some of the islands in the New Hebrides. On one of these islands, he approached a rather weather-beaten navy type quonset hut. Over the door an equally weather-beaten sign proclaimed that here was the "Joint Communications Center," such-and-such island base command. Inside, however, everything was business. He was met at the door by an alert, red-headed Army Buck Sergeant who saluted sharply, reported the center ready for inspection, and stood by.

General Ingles was a firm believer in getting the enlisted man's point of view and made it a point to do so wherever he went. He put the Sergeant at ease and then said, "Sergeant, I noticed outside that the sign over your door said, "Joint Communications Center." What does the term "Joint Communications" mean as far as you are concerned?"

The Sergeant thought a minute and then smiled and said, "General, I haven't seen in any book what it means, but we and the navy men here have got it figured out that it means that the Navy furnishes the *Joint* and the Army furnishes *Communications.*" I believe that in a way this version comes close to the right idea. To me, the most difficult part of the term, "Joint Communications-Electronics," and the most important, is the word "*Joint.*" However, before we discuss the term "Joint," I would like to clear the air with a definition for "Communications-Electronics."

The Military Services have adopted official definitions for the terms "Communications" and "Electronics" which, I believe, are accurate and useful. I would like to quote them to you without explanation for I do not believe they are difficult to understand. "Communications is defined as a method or means of conveying information from one person or place to another, except by direct conversation or correspondence." "Electronics is defined as that branch of electrical science which treats of the behavior of electrons and their use for the realization of certain objective effects."

I might add here, parenthetically, that the military services are concerned principally with these objective effects. As for the term "Communications-Electronics" there is no officially adopted definition, but, I do believe that it is reasonable to assume that in the military services, the word encompasses those aspects of both communications and electronics of interest and use in military communications.

Now what about the "*Joint*" part of it? To me, in its simplest terms, the word "Joint" means "Together." Yet there is more to it than just that. Frequently we hear that Congress has met in joint session. The members of

both houses sit together at a common location for a common purpose, and yet neither loses its identity. Likewise, when the three service heads sit as the Joint Chiefs of Staff, they do not lose their identity as the chiefs of their respective services. Yet, regardless of their personal or service view, they consider problems from the over-all standpoint.

My attempt at a definition cannot be backed up by any text book or dictionary. Like the Sergeant's version, it is simply one man's opinion. The term "Joint" implies planning by two or more elements to the end that, when they operate as individual elements, the force and power generated by one will combine with the forces and powers generated by the others to obtain a maximum result in the desired direction. The organization in the field of military communications-electronics which coordinates this joint effort, is the Joint Communications-Electronics Committee, better known as JCEC. I am sure that you have all heard of this committee. Some of you are probably very familiar with it. I must believe that your invitation to me to speak on this subject means, however, that you want to hear what it does and what it is doing.

Obviously, we can't cover the entire field in a half hour; likewise I do not believe it would be of much benefit to give the subject the broad-brush treatment by discussing briefly *all* of its main aspects. What I would like to do is to bring you up to date on certain facets of JCEC which, I believe, will most interest you.

First, I would like to explain what JCEC is, who its members are, and how the office of the Director, Communciations-Electronics fits into the picture.

Secondly, I want to describe what JCEC does and what its purpose is. I will comment briefly on certain specific functions which, I believe, are most likely to interest you.

And third, I want to show you, by relating some specific examples, the growth of the joint concept in JCEC and the progress it is making in accomplishing its mission.

The JCEC is the agency of the joint chiefs of staff responsible for matters in the field of communications-electronics. It was established in 1947 under the provisions of the National Defense Act of that year. Prior to that time the responsibilities for communications-electronics matters belonged to an organization known as the Joint Communications Board. The change in name reflected the expanded responsibilities and growing importance of communications-electronics in military affairs. I should like to point out that except for frequency matters, JCEC is a planning organization rather than an operational unit. It makes plans and formulates policies, doctrines, and procedures within its field; but its decisions pertaining purely to military communications-electronics are implemented by the individual service. The JCEC acts as a unit when it deals with agencies other than the three military services. It represents the services with other joint agencies such as the Research and Development Board and the Munitions Board. It represents the joint chiefs of staff in dealing with communications-electronics agencies of other nations and the North Atlantic Treaty Organization.

The JCEC proper consists of four members—The Director, Communications-Electronics Joint Chiefs of Staff is the permanent chairman; the other three members are the Chiefs of Communications of the Military Departments. The present incumbents are the Chief Signal Officer, U. S. Army, Major General G. I. Back; The Director, Naval Communications, Rear Admiral W. B. Ammon; and the Director of Air Communications, Major General R. C. Maude. I am sure that many of you are acquainted with these gentlemen. With the exception of myself, each member has an alternate from his own service. (I shall explain the position of the Director, Communications-Electronics in a few minutes.)

The "pick and shovel" work is done by service representatives organized into small groups called panels. May I put your minds at ease on one point right now. I am not going to unroll a large block diagram filled with complicated lines, dashes and squares labeled with important-sounding names. I do not believe that it is either desirable or necessary to explain the internal structure of JCEC in order for you to understand the purpose and functions of this committee. As I mentioned a moment ago, I would like to explain briefly how the office of the Director, Communications-Electronics fits into the picture.

This office was established by a directive from the Secretary of Defense in 1949. If you will recall, at that time considerable importance was being attached to economy in government. It was in pursuance of this idea that the director was charged with effecting economy and efficiency of military communications. The director has two hats. With one of his hats he serves as advisor to the Secretary of Defense for military communications-electronics matters. When he wears his other hat, he serves as the chairman of JCEC.

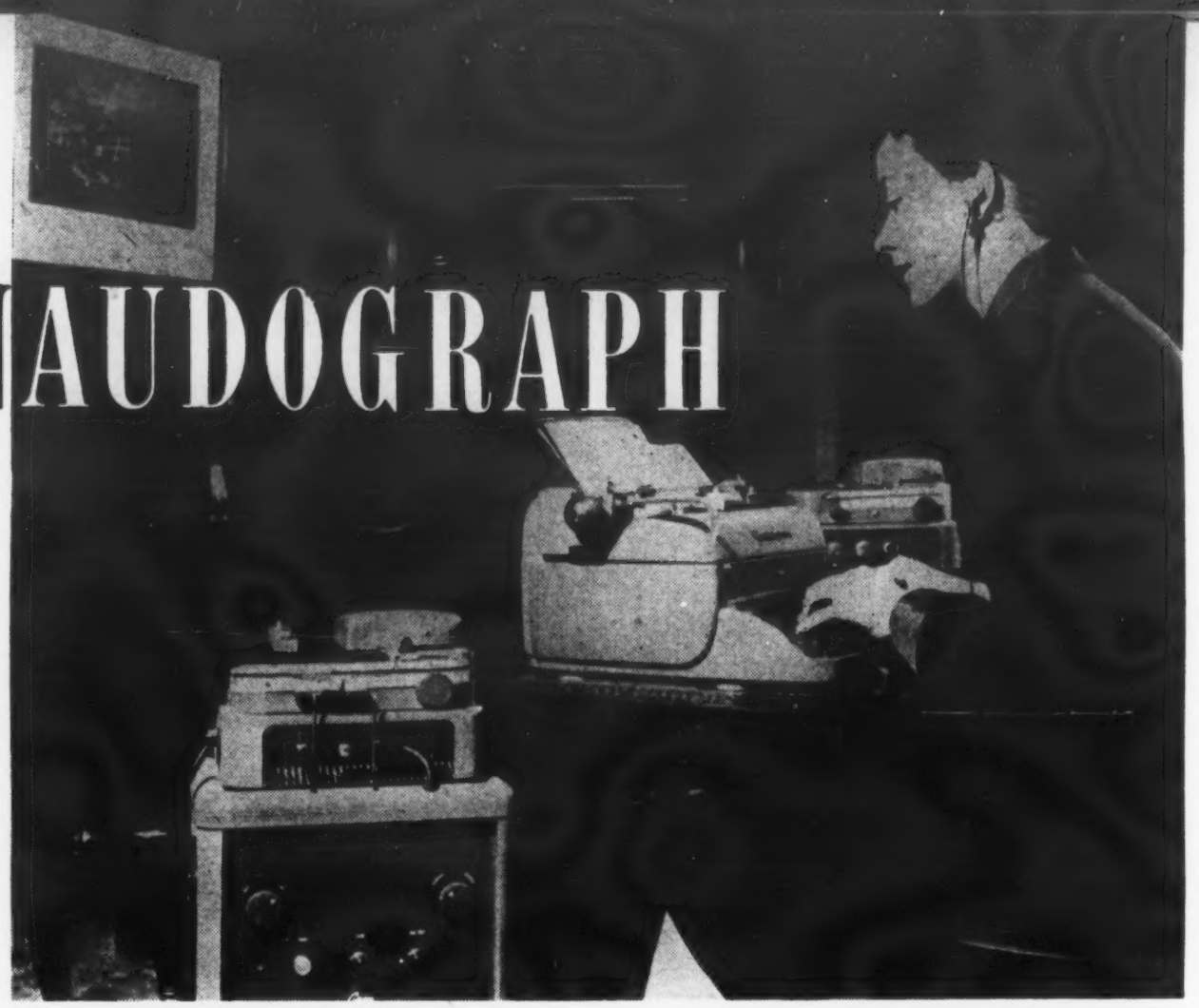
As Director, Communications-Electronics, I have six assistants—two Army, two Navy and two Air Force. These officers are full-time assistants and have no individual service responsibilities. Hence, their service loyalties are subordinated to joint and national concepts to the point where it is not unusual to find them most critical of the activities of their own services. Under the terms of the directive establishing my office, I have no alternate chairman of JCEC. In my absence the senior service member present becomes the chairman. Thus, my assistants are more or less my personal advisors, and have no direct affiliation with JCEC. They do, however, sit in on panel meetings to advise the members and expedite the work.

The director's office is unique in that he is the only full-time Joint Chiefs of Staff member who can resolve disagreements among the military departments (excepting matters that require the attention of the Joint Chiefs of Staff). He was so empowered to enable him to carry out his charge of effecting economies and efficiencies in military communications. So much for what JCEC is.

The next logical question is—what does it do and what are its functions? The functions and responsibilities of JCEC are contained in its charter. Here, in a few hundred words, is set forth in detail exactly what JCEC is charged with doing. I believe, however, that the sum and substance of these words can be briefly stated as follows: To insure maximum economy and efficiency of military communications and to strengthen the direction and coordination by the Joint Chiefs of Staff of communications-electronics activities of the Department of Defense. If you will recall the definition of the "*Joint*" that I proposed a little while ago, I believe you will recognize that the purpose of JCEC is truly a joint one. Stated in a different way, we can say that the operations of the military services in the field of communications-electronics will be directed and coordinated to obtain the maximum total result from the individual efforts of the services. To give you a clearer idea of how this purpose is carried out, I have selected three specific functions to discuss with you. (1) Standardization of communications-electronics equipment with the military services; (2) The joint employment of the communication facilities; and (3) The establishment of Joint communications methods and procedures and their implementation

(*Continued on page* 75, *col.* 1)

PHONAUDOGRAPH



Among the outstanding new examples of the application of developments in the electronic communications field to machines which increase efficiency and lower costs in everyday business affairs is the telephone dictation system announced by The Gray Manufacturing Company, manufacturers of Audograph dictation and transcribing equipment.

Called the PhonAudograph, the system is radically new in that it gives the user complete control over the recording machine, which may be many rooms away from him, through a set of four push buttons. He has the same control over the recorder he would have with a conventional machine right in front of him on his desk.

The system, commercial sales of which will commence in the near future, is designed to provide low-cost dictation facilities for a number of users by tying in a quantity of inexpensive dictation telephones with a single recording unit. The recording machine may be located at the desk of a receptionist, a switchboard operator or a secretary. An occasional glance at the machine suffices to tell her it is operating properly and when to change the plastic recording disc.

It might be said that this is a party-line arrangement, with all the disadvantages of a telephone party line. Actually, however, though all the dictation telephones are on a single line, the resemblance ends there. The system is designed for use by "fringe" dictators—those who need dictation equipment but who do not need it full time and for whom the cost of providing individual machines would be prohibitively high.

To dictate, the user picks up his dictation phone and talks. Set in the handle of the handphone is a stop-start button, operated by the touch of a finger. Three of the push buttons on the base of the telephone serve to give the user control over (1) marking end of letters on the index strip on the recording machine, (2) indicating corrections or special instructions to the transcribing secretary, (3) listening back.

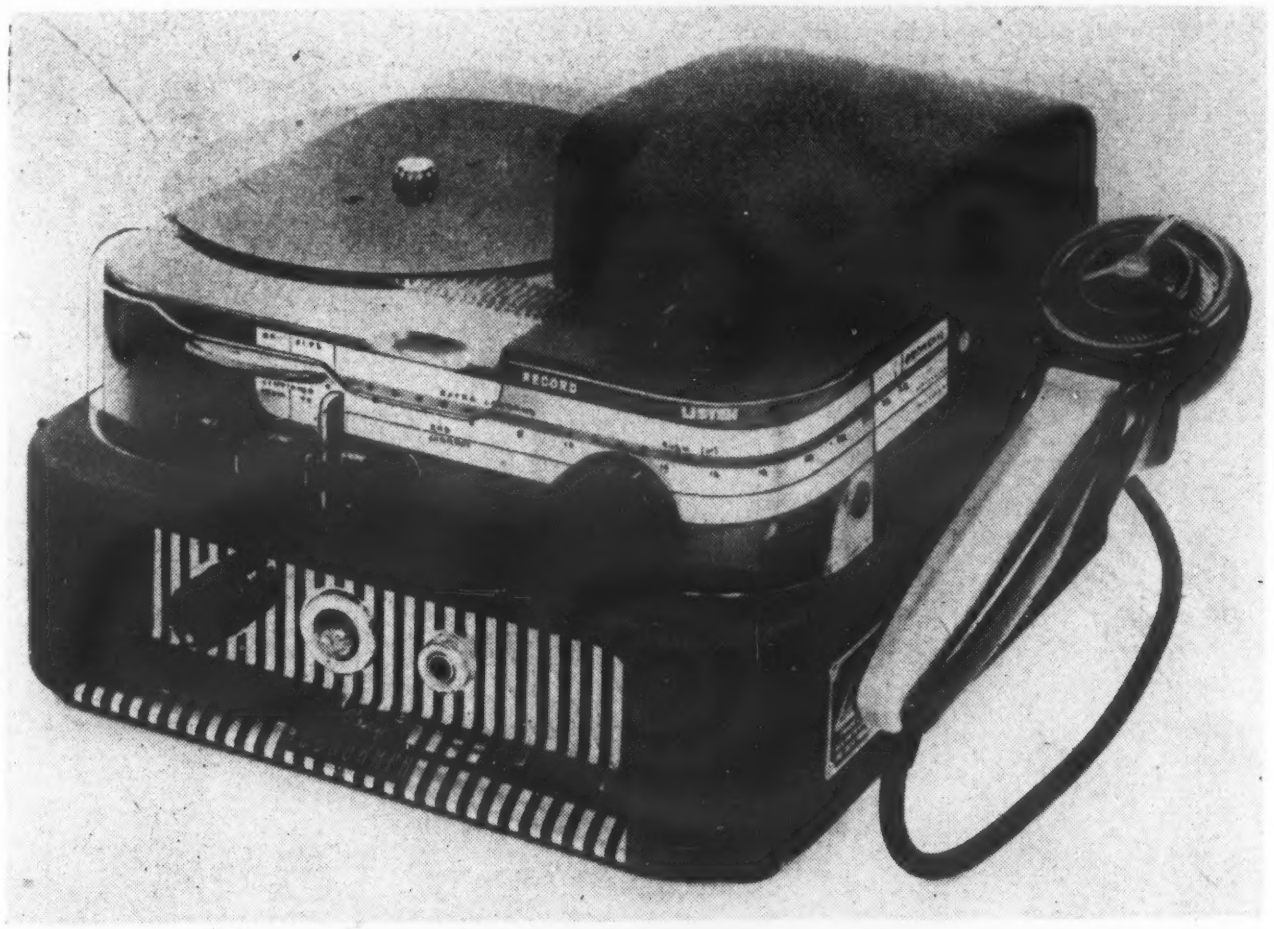
The fourth button signals the attendant that the dictator wants to talk with her. She has a special phone cradle on the side of the PhonAudograph recorder and when the user "buzzes" her, she can talk with him in privacy over this in-built phone system. He talks to her through his dictation telephone.

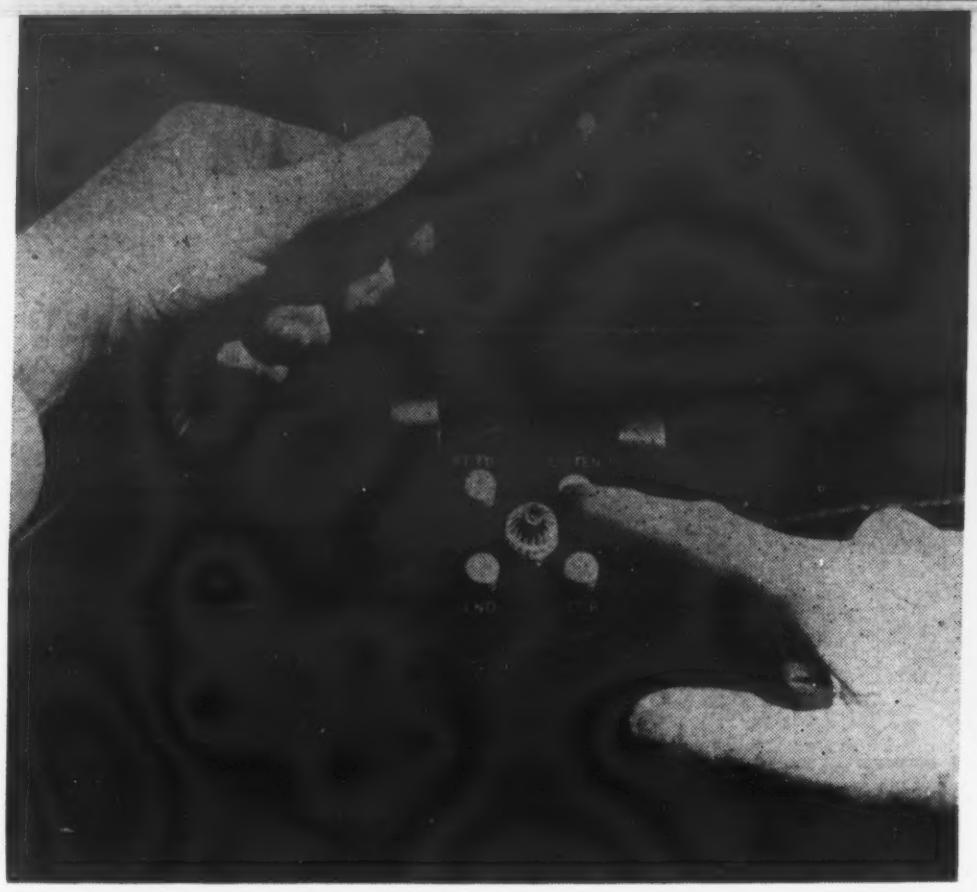
The system incorporates an electronic "automatic memory," which can be best explained by an example of its use.

When a user has dictated for some minutes, he may be interrupted and wish to play back some of his dictation when he is ready to continue to pick up his train of thought. A touch on the "Listen" button plays back a pre-set amount of dictation, which may, for example, amount to ten words. When the playback is completed, the "automatic memory" tells the recorder to skip a small amount of space on the recording disc and shift from the playback position to ready-to-record position. At the same time, the user gets a tone in his earphone which tells him, "All clear, go ahead and dictate."

Should the user wish to listen back to something he had dictated first on the disc, a phrase or paragraph followed by perhaps 20 or 25 minutes of additional dictation, he merely has to touch his "Listen" button as many times as necessary to go back to that part of the disc. When he has listened to what he had said, he may be through with his dictation and hang up. In that event, the "automatic memory" goes to work, the machine keeps going, and takes the disc back to "ready-for-dictation" position, skips a few moments worth of recording space and then tells all users the system is ready for use again. On each dictation telephone is an amber

The Gray Audograph.





• Correction, playback and termination are controlled by this unit.

light which flashes on when the system is available for use.

However, should the user wish to continue dictating after he has played back the words in question, he would not wish to wait while the whole recorded disc was played back to him. He would then "buzz" the attendant, tell her to manually return the disc to the "record" position, and resume dictating.

The "automatic memory" makes sure that whenever the attendant is talking with the user, recording stops so that the conversation is not recorded and no space on the disc is wasted.

Another electronic feature of the new system warns the secretary and the dictator when the end of a disc is being neared. A single disc holds up to an hour's dictation, half an hour on a side. In the last four minutes of space for dictation on a side, a light flashes on the recording unit, telling the secretary "don't go away." In the last few moments of space available on a disc, a buzzer tells her to change the disc.

The user gets a soft warning tone in his earphone at the four-minute mark, telling him to finish up as soon as possible. This tone increases in intensity as he continues, making unmistakably clear to him that his time is about up.

Basically the PhonAudograph is an adaptation of the Audograph, incorporating all the electronic features of that machine—features which have pushed Gray into second place in the dictation equipment industry in the six years since Gray's first dictation machine was introduced.

Recording is done on plastic discs. Three sizes are available, half-hour, forty-minute and one-hour. The disc is rotated by neoprene-faced rollers, one below and the other above the disc. The rollers are mounted close to the recording stylus, which is in a fixed position in the head of the machine. The disc is drawn laterally beneath the recording stylus, which cuts approximately 260 grooves to the inch. Inasmuch as the rotation is imparted to the disc through a roller friction drive, the disc moves at a constant speed at the point of recording. The disc therefore turns more slowly as the outside circumference is approached in recording. This means that there are the same number of words per unit of distance in every groove, assuring maximum fidelity.

By eliminating the turntable, with its weight mass, there is no inertia to overcome and no "backlash," which pleases transcribing secretaries.

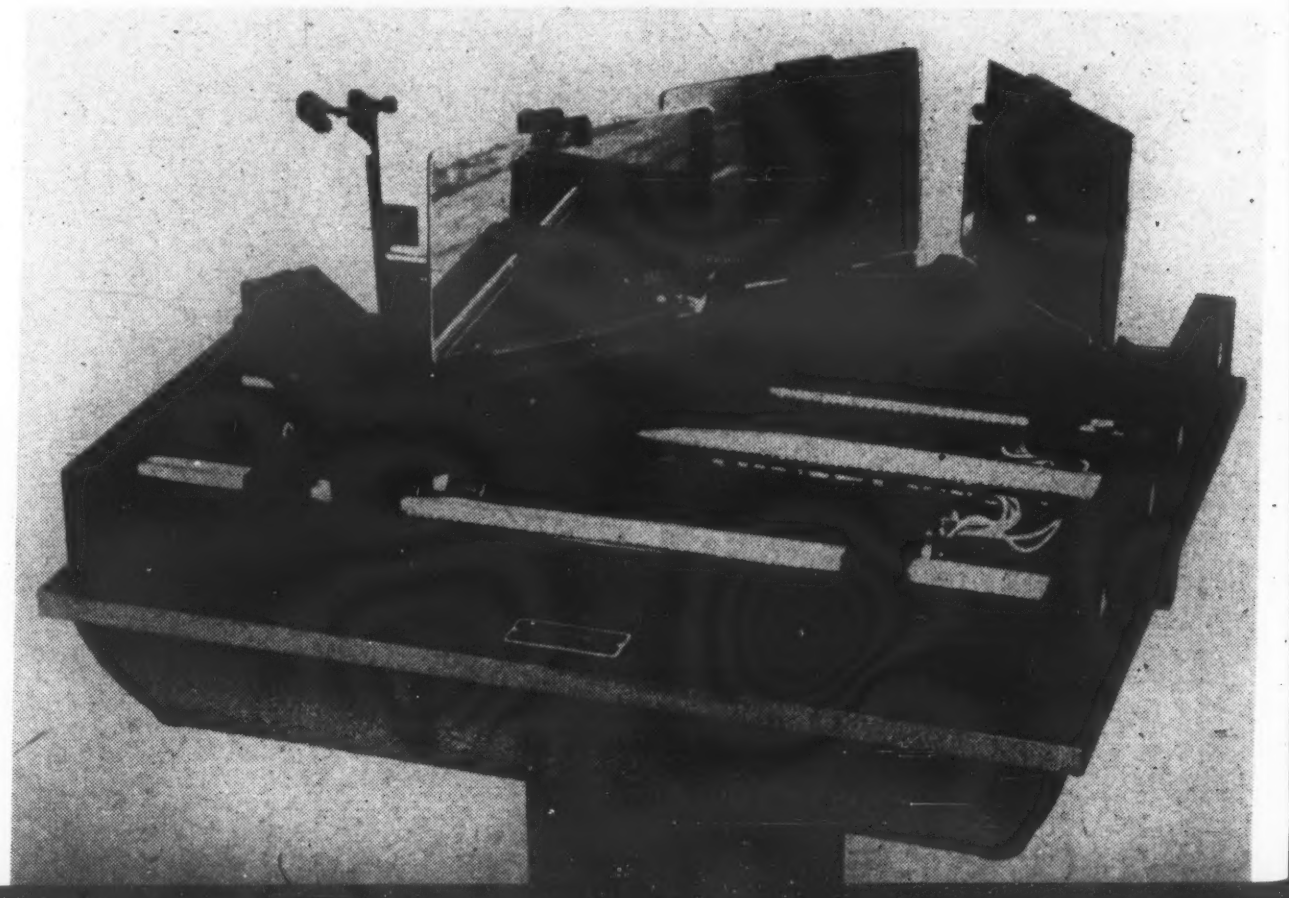
Gray developed and manufactured the telephone pay station in the years after 1891. Its telephone experience has stood it in good stead and has led it into allied lines which today give the firm a diversified line of products.

Gray makes, for example, the Vocatron intercommunication device which operates on the "carrier" principle, superimposing a small high-frequency signal voltage upon the power line. Used widely in industry and home, the Vocatron utilizes the regular electric power and lighting circuits as its transmission medium and requires neither special wiring or any other installation.

As contrasted with attempts previously to develop this system, the Vocatron has eliminated annoying interference, such as that from motors, office machinery and other appliances. It incorporates a special silencing circuit and keeps the receiver in an absolutely "dead" condition while "standing by" until activated by a signal from another unit. The product is made for the Vocaline Company of America of Old Saybrook, Conn.

Gray also makes the AM-65 a-f amplifier and electronic mixer, designed to provide interphone operation and radio monitoring in vehicular installations using one or two receiver transmitters and interphone

Precision unit allowing for simultaneous operation of pairs of projectors into a single TV camera or individual operation into two separate cameras.



control boxes. It is a light-weight, compact three channel amplifier. Gray went into production on this piece of equipment for the Signal Corps within five months of awarding of the contract. Shipments began a month later. The AM-65 is a component of the Corps' new GRC 3-8 series.

Gray is also building another component in the same series. It has developed a unique marking device which is used where previous markings were damaged by varnish applied to protect against moisture and fungus. The marking is done on a special aluminum shield, which is quickly attached to parts to be marked. It saves all the time required in the use of masking tapes, and has been found to be more effective.

Subsidiary

Gray Research and Development Co., Inc., Manchester, Conn., a subsidiary of Gray Manufacturing, are specialists in control and data transmission systems based on digital techniques. The company has developed methods whereby analog information may be converted to digital in terms of miniaturized, ruggedized and reliable systems and components.

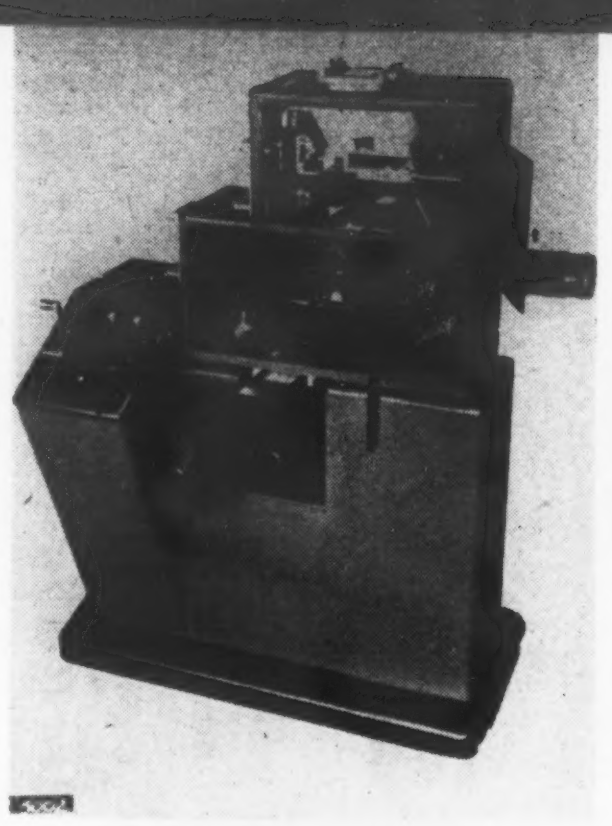
For example, Gray Research engineers have taken the magnitude of some continuously varying perameter, such as temperature, voltage, altitude or relative humidity and converted it into a series of binary pulses which required a very narrow band width for transmission and which could be recorded at either remote or master stations in printed form.

The engineers can design systems for controlling drones, rockets, guided missiles, atomic weapons, guns, tanks, airplanes, ships, buoys and related equipment.

The company has engaged in a number of black and white and color television development projects. With the help of CBS, they have developed the Gray Telop, a piece of TV studio equipment which is used to show "commercials," titles, dissolves, fades, superimposures, and dual projection. The Gray camera turret for TV studios enables a single television camera to serve several film projectors.

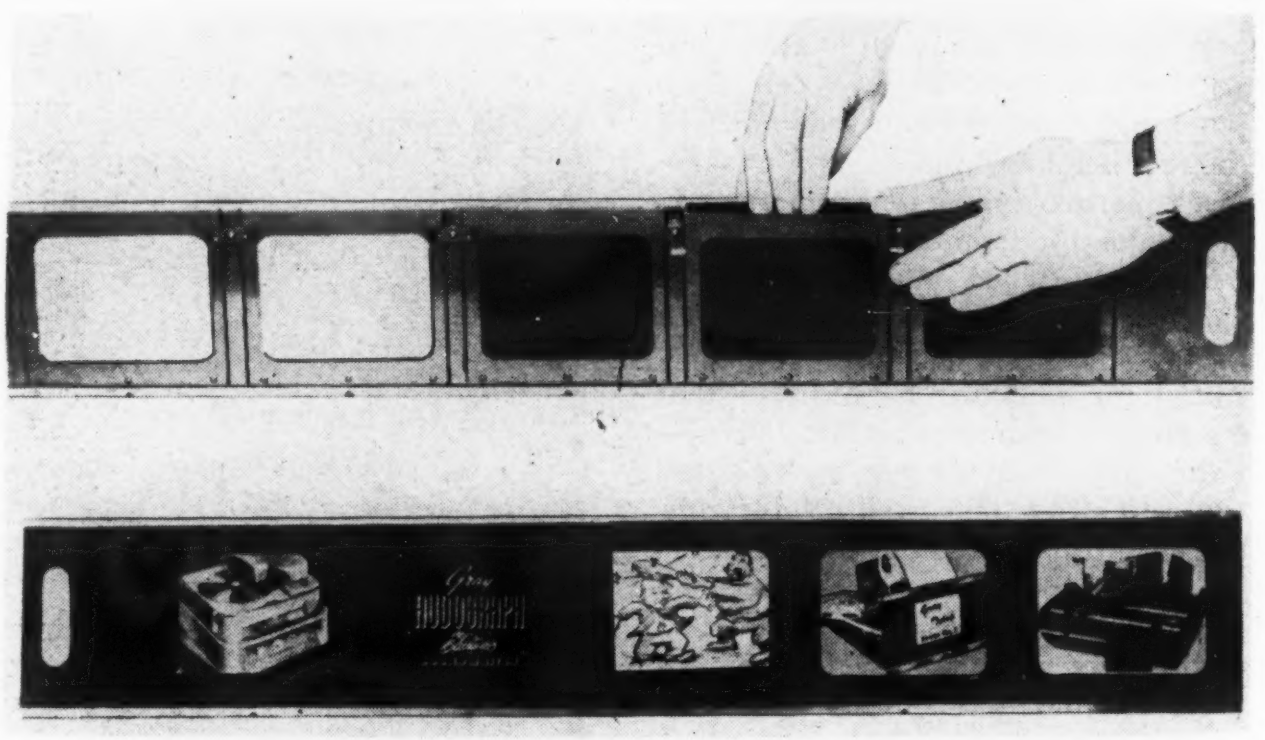
The Gray Multiplexer is a mirror system which makes it possible to operate a pair of film projectors simultaneously into a single TV camera or individually into two TV cameras.

Other equipments associated with these products are Micro Switches,



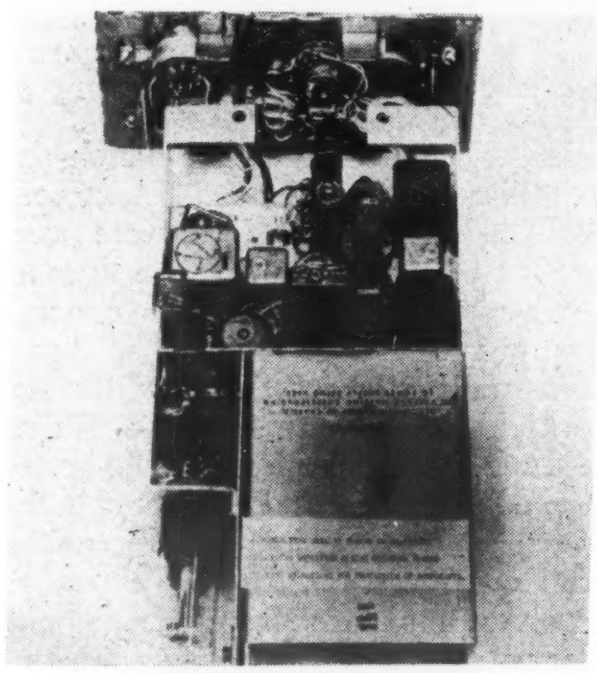
Gray Audograph "Telop."

The PhonAudograph.

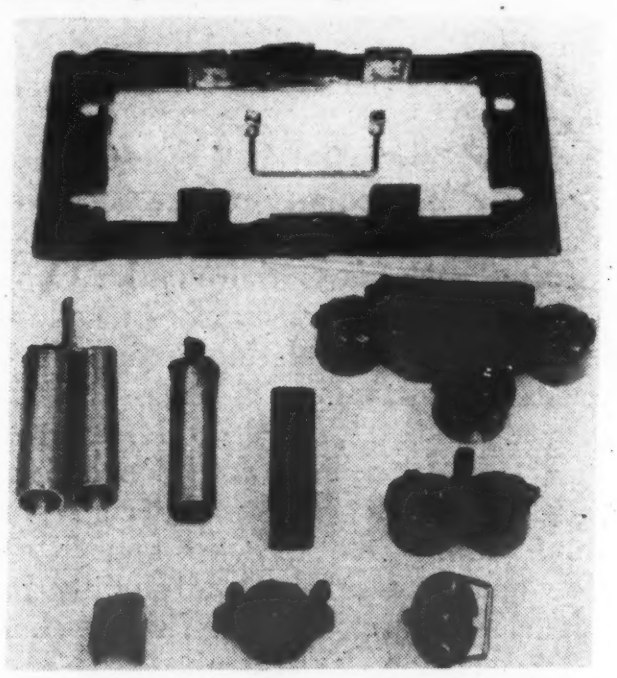


Above: Use of slide holder and view showing prepared strip for use in TELOP.

Below: Masking devices. Aluminum type shields used by Gray to protect components of AM-65/GRC Interphone Amplifier during moisture fungus.



Light Boxes for transparencies, Reverse Reading Clocks which permit the superimposure of commercial copy over or under the clock face, and Sound Effects Consoles.



At present, Gray Research & Development has undertaken a study phase of the development of an all electronic Rear Screen Projection System. They are exploring the possibilities of adapting television equipment and television techniques for military use.

Navy Radio Receivers in a tropical climate

By: Charles DeVore

A four-year study of Navy communications receivers in a Panamanian jungle has revealed that none of the equipments studied are capable of giving prolonged, dependable service under the tropical conditions encountered. As an additional significant revelation, Naval Research Laboratory engineers reported they found no evidence to indicate that treatment with fungicidal varnish either prolonged the life or increased the reliability of treated equipments.

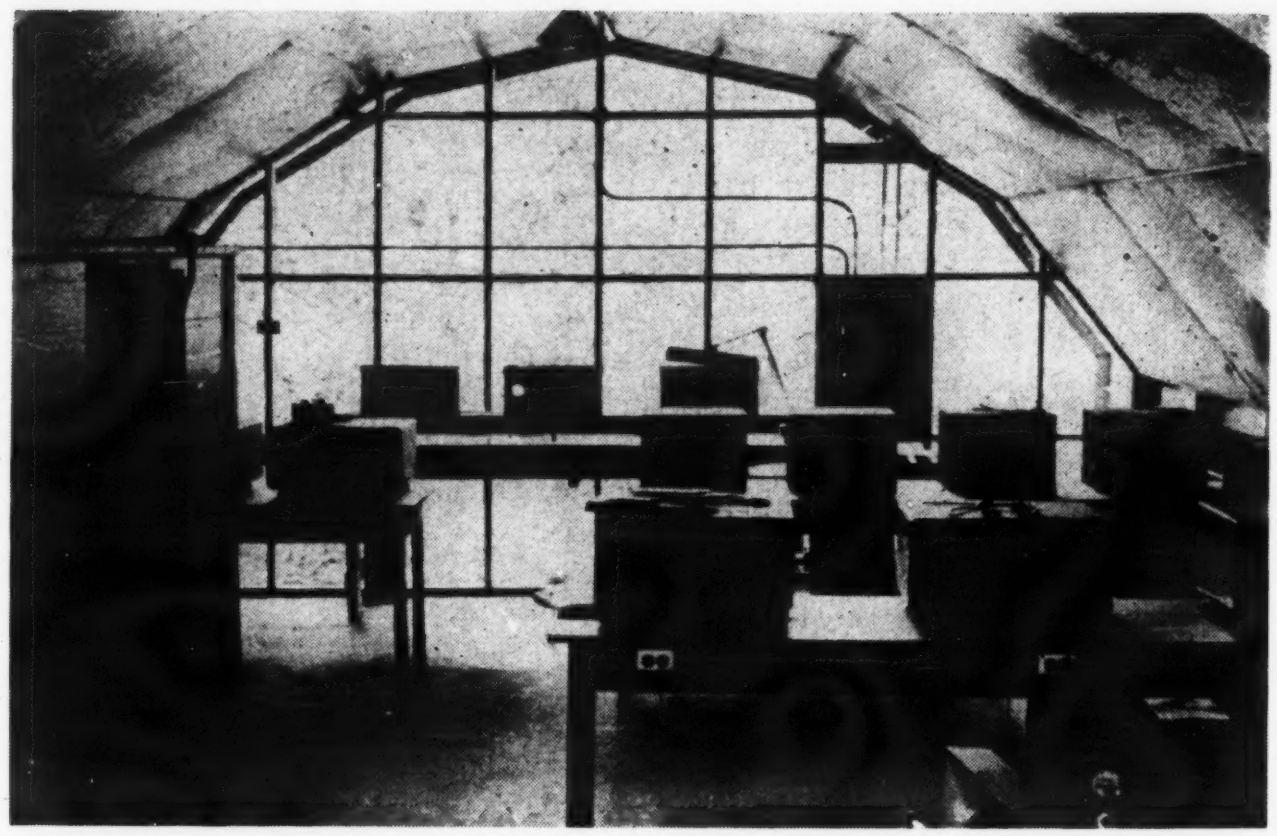
On the positive side, the researchers came up with a number of recommendations for design of military radio receivers intended for tropical service. Among the more significant are these:

1. Eliminate fungus-susceptible materials such as natural-fiber cable lacings, cotton insulations, cellulosic plastics, and vinyls plasticized with fungus-susceptible materials.

2. Develop flexible glass-to-plastic bonding cements or nonswelling plastics for meter cases and tube sockets.

3. Because ferrous parts rust severely, particularly on areas where condensed moisture can accumulate, protect such parts thoroughly. Conventional pigmented finishes in addition to cadmium plating or other acceptable surfacing, if necessary, is recommended.

4. Moisture and fungus-proofing coating (MFP) assists materially in maintaining the esthetic appeal of low-quality receivers and slightly in the case of high quality. This psychological factor is believed to be important, but its significance was beyond the scope of the NRL study.



Navy receivers of varying quality levels, coated and uncoated, were exposed to tropical conditions for four years in a Panamanian jungle in this Quonset hut by engineers of the Naval Research Laboratory of the Office of Naval Research.

During the war in the Pacific, electric and electronic equipment showed high rates of failure of functional impairment. These difficulties were in large measure attributable to the climatic conditions under which the equipments were transported, stored, and used. High humidities were prevalent and along with the atmospheric conditions went high concentrations of micro-organisms. As a consequence, a great deal of the defective equipment showed mildew growth. Moisture alone might be responsible for the failure, though the possible role of mildew was given full consideration. In any event, to exclude moisture from circuit elements, it became a common practice to cover them with an organic coating. Because the coating material itself was somewhat susceptible to fungus attack, the incorporation of a toxic agent in the coating agent in the coating formulation was the custom. The coating material and its method of application are described in JAN Specifications JAN-C-173 and JAN-T-152.

The treatment became quite general; under the stresses of war it seemed like a good idea, but there was no proof then or later that the specified treatment actually prolonged service life of the equipment or increased its dependability. Cotton braided wire, for example, is admittedly an inferior item for use under conditions of high humidity and fungus, but the enormous demands of war dictated that it be used in many cases. The MFP treatment itself, however, was extended to equipments of relatively high quality, including items of high moisture resistance and minimum susceptibility to fungus attack. To some observers

it seemed highly probable that MFP might really be useful on lower-quality equipments, but that it was superfluous, or even degrading, on the superior items.

To assess these views realistically, Navy communications receivers of varying levels of quality with and without MFP were exposed in the natural tropical environment of a Panamanian jungle and performance measurements were made at the site of exposure. The program, which was sponsored by the Bureau of Ships, had three objectives:

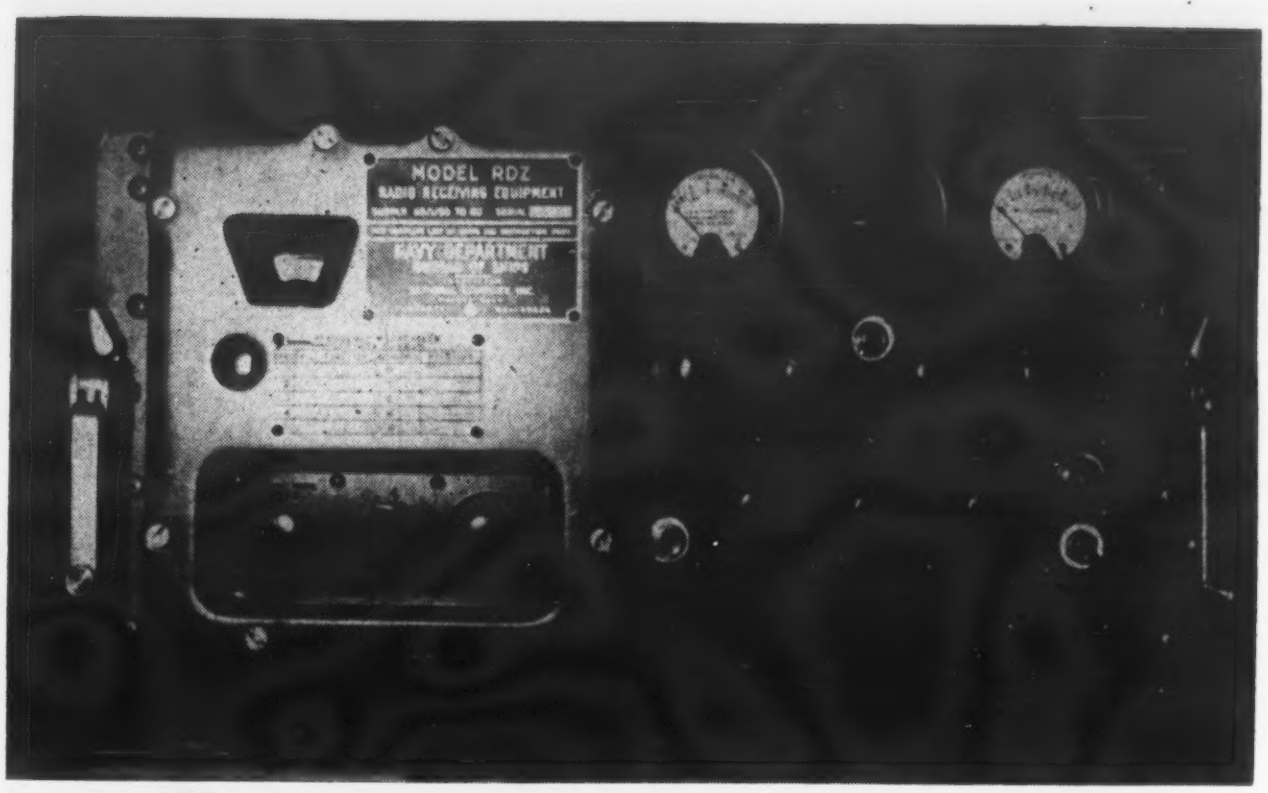
(1) to investigate the ability of various types of naval equipments to withstand prolonged exposure to tropical conditions;

(2) to investigate the relative merits of equipments of differing quality; and

(3) to evaluate the merits of MFP coatings as applied to equipments of various constructional qualities.

This study was under the general direction of Kingsley G. Williams and C. T. Lempke of NRL's Chemistry Division (Mr. Lempke is now with the Navy Bureau of Ships).

In all, eighteen receivers were obtained for the test. It was intended that they should represent at least three quality levels; actually, there were only two: very good and very poor. Four units each of the RAK, RAL, and RBK receivers, all uncoated were received. The RAK and RAL receivers are definitely outmoded but do represent the highest construction standards of their era. These receivers are rather elementary regenerative receivers operating in very low frequency ranges. The RBK's are built to commercial standards and make no pretense of meeting military requirements. One receiver of each of these three types had seen previous service, the rest were in new condition. Two of each type were reserved in their original uncoated condition to serve as controls, while the rest were cleaned and then sprayed with a phenolic resin oil varnish containing 10 per cent pentachlorophenol. The coating material and its application conformed with the JAN specifications mentioned above.



Navy type RDZ radio receiver, exemplifying high component quality and the latest in equipment design, at the start of the four-year study of receivers in a tropical climate.

Exemplifying high component quality and the latest in equipment design were six new RDZ receivers (basically designed incidentally by NRL) two of which were uncoated and the remaining four described as having been coated by the manufacturer in accordance with the specifications. The RDZ units are advanced superheterodynes operating in the range of hundreds of megacycles.

All eighteen receivers were placed on exposure in a well-ventilated, concrete-floored Quonset hut surrounded by reasonably dense jungle vegetation. Temperatures ranged between 75 and 85 degrees F, with humidities ranging from 74 to 100 percent. The receivers rested on wooden tables roughly three feet above floor level. One uncoated receiver of each type was operated continuously (the operated control). Another uncoated unit of each type was left unoperated and the coated receivers similarly were left unoperated. The unoperated receivers were energized only while performance measurements were being made. Sensitivity measurements were made at three widely spaced frequencies on each receiver. Warm-up periods were kept to a minimum (usually less than five minutes) to avoid excessive drying and to permit as nearly as possible an appraisal of the instantaneous condition of the receivers. At the conclusion of the exposure, various resistors and capacitors were detached and appropriate measurements were made. These findings can be summarized as follows:

Mean percent of rated value

	Uncoated	*Coated*
Resistors	114.3	114.5
Cased paper capacitors	105.7	112.9
Molded mica capacitors	125.4	191.9

With the resistors and paper capacitors, the difference between the coated and the uncoated units had no statistical significance. With the mica capacitors, however, the difference between the coated and uncoated is highly significant, favoring, it should be noted, the uncoated components.

After five months' exposure, corrosion had attacked the top of the DRZ receiver cabinets to this extent.

Of the eighteen receivers included in the program, only two survived 44 months of exposure without requiring component replacement, complete realignment, or both. One of these was a coated RDZ receiver, the other a coated RAK. Excluding vacuum tubes, the lowest component failure rate was registered by the RDZ units followed in increasing failure rate by the RBK, the RAL, and the RAK. There seems to be no statistically significant difference between the failure rates of treated receivers.

In the case of the RDZ receivers, crippling defections were limited to mechanical failure of the autotone units or spontaneous detuning of the r-f circuits, neither of which were coated. Failure of the autotone units apparently resulted from some mechanical binding, possibly due to corrosion within the motor bearings or gear train. In the case of the RAK and RAL receivers, component failures apparently occurred randomly between control and noncontrol units, and it is accordingly believed that the fact that both units were coated is accidental.

The decline of the RAL and RAK receivers could not be laid to any specific causes. Power units, resistors, potentiometers, and mica capacitors were the principal sources of trouble. The ease with which these receivers could be serviced, the relatively small number of components, and the provision for operational adjustment of tuned circuits contributed greatly to the excellent sensitivities recorded for these receivers.

Deterioration of the tuned r-f circuits of the RBK receivers was responsible for the early sensitivity decreases observed. That moisture absorption was responsible seems to be indicated by the fact that the operated control maintained normal sensitivity. Transformer breakdown was responsible for the ultimate failure of all these receivers. A few mica capacitors and fixed composition resistor failures were observed in the RBK receivers, but their over-all component failure rate was less than that for the RAK and RAL receivers, at least for the first 18 months of exposure.

Physical deterioration patterns for the various receivers became evident within the first three to six months of exposure. During that time, corrosion of metal parts developed, fungus growth appeared on hookup wire and volume changes and warping of certain plastic parts became apparent. Since that period, the extent and severity of corrosion and growth increased, but few signs of deterioration developed which were not predictable from the early stages of the exposure.

Fungus growth inside the cabinet of the Navy RDZ radio receiver after five months' exposure in a Panamanian jungle. Note that the growth has centered in the natural fiber lacing cord but has spread along the relatively non-susceptible plastic insulation. This was the heaviest fungus growth in any of the six RDZ type receivers. Shield in the foreground has also become tarnished.

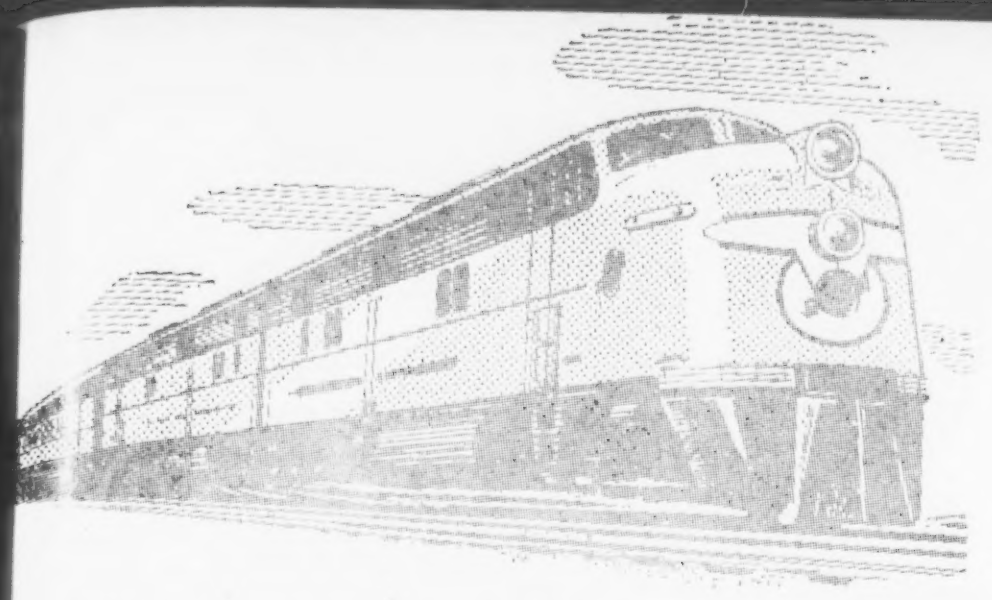
In resistance to physical deterioration, the higher-quality RDZ receivers proved markedly superior to the included types. This is largely due to the avoidance of fungus-susceptible material, the exclusion of materials and finishes of poor corrosion resistance, and the protection afforded by the nearly sealed cabinet.

Corrosion resistance of the RAK and RAL receivers proved to be nearly as good as that of the RDZ. The extensive use of fungus-susceptible hookup wire and cable lacing in these receivers resulted in a generally inferior appearance. The low-quality RBK receivers, being constructed largely of cadmium-plated steel, corroded heavily on all surfaces subject to accumulation of condensed moisture. Because of the open cabinets of these receivers, the upwardly exposed surfaces of chassis, transformers, shields, and chokes rusted heavily. Cadmium plate proved adequate to prevent excessive corrosion on protected areas beneath the chassis. All hookup wire and certain plastic parts of these receivers supported heavy fungus growth, which further degraded the general appearance of these receivers.

In this program, no evidence was developed which indicates that the performance of the coated equipments was in any way superior to that of the uncoated. Sensitivity of all unoperated controls was maintained at approximately the same levels as those of the coated receivers. Component failure rates were roughly the same similar types of components failed in both the coated and uncoated receivers. While it was impossible to determine the precise cause of failure of those components which did break down, the evidence seems to indicate that moisture absorption was the principal deteriorating factor rather than fungus growth. The results of the capacitance and dissipation measurements on coated and uncoated molded mica capacitors seem to indicate that application of coatings to certain components may actually result in greater degradation that would occur were the components uncoated.

Fungicidal coatings, however, did prove capable of minimizing fungus growth and corrosion on materials which have poor inherent resistance to tropical conditions. As these materials are normally used only in relatively low quality units, the ability of coatings to maintain the esthetic appeal of electrical equipment falls off very rapidly as the quality of the equipment increases. Inhibition of corrosion by the MFP coating on aluminum, magnesium, brass and other non-ferrous materials seems to be inferior to that of conventional pigmented systems.

It is also important to keep in mind that appearance of the equipment is not necessarily an indication of its performance capabilities. A fungus-susceptible but moisture-resistant component will work better in a circuit than one of lower fungus susceptibility but higher moisture absorption.



CENTRALIZED RADIO CONTROL of RAILROADS

By

R. B. Barnhill

Commercial Sales Mgr.
Bendix Radio

Just imagine a railroad dispatcher controlling a net work of trains, extending over hundreds of miles, almost as easily as a twelve year old boy operates his model railroad system in the basement. Perhaps, not quite so simple as that, but certainly presaging a new era in railroad communications, is the latest electronic development now in production at the Bendix Radio Division of Bendix Aviation Corporation.

Known as the CRC system (which means centralized radio control), this newest advance in railroad signaling is the result of more than seven years work on the part of Bendix engineers and communication experts from the Northern Pacific Railroad. Naturally enough, the first completed system has been installed on the NP, and units are now operating on some thirteen diesel engines and thirty-five cabooses running through North Dakota and Montana. The system is an answer to a problem which has long vexed the railroads and provides, for the first time, a completely integrated railroad radio communication system.

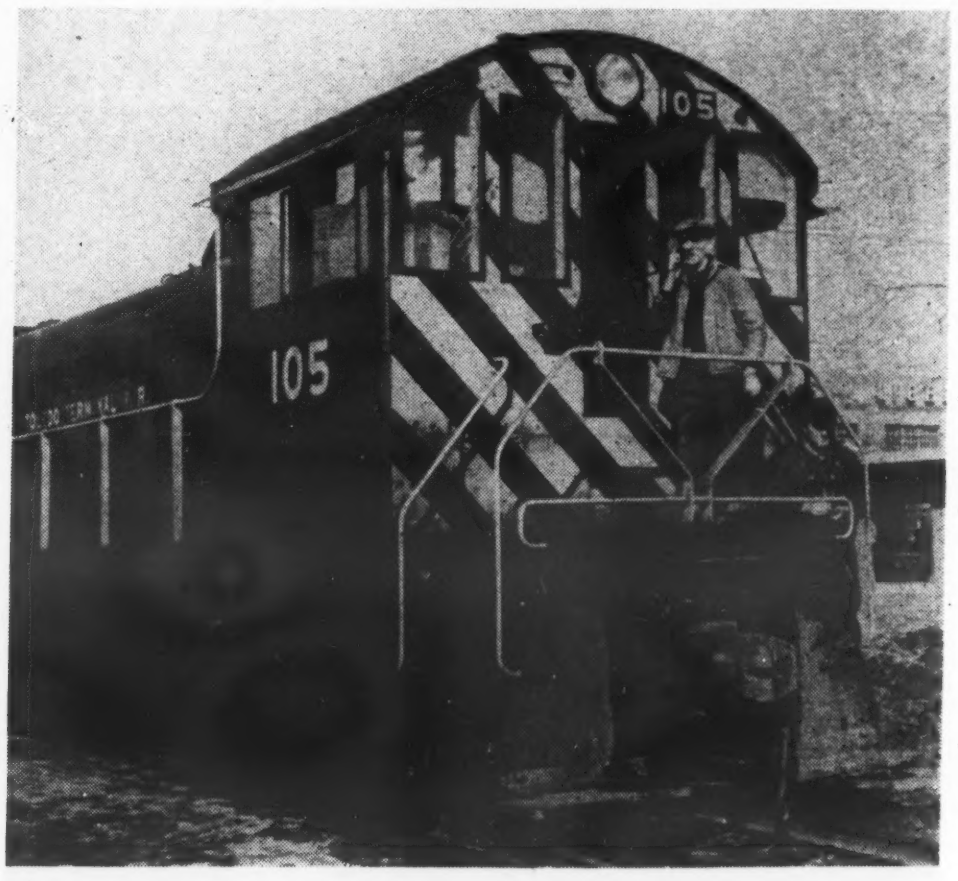
In the past, the actual whereabouts of a train and what was happening to it between stations, has often been clouded in mystery. The dispatcher, by the use of standard railroad block signals, could tell that a train was somewhere within a given area and between two stations, but just where, he was unable to ascertain. The only means of communication between the dispatcher and the locomotive engineer was by means of telephones located along the railroad right of way. Such a system had many disadvantages and was responsible for needless delays which mean dollars and cents to most railroads. In addition, lack of communication between the engineer and the caboose at the end of his train, resulted in mishaps which on many occasions seriously damaged railroad rolling stock.

Take, for instance, the case of a fast freight, with perhaps 125 freight cars rolling along at a fifty mile an hour clip. What happens when the men in the caboose discover a serious mechanical failure in one of the cars near the end of the train. Such an occurrence might lead to derailment of the train or other serious consequences, but unable to communicate with the engineer, they have only one alternative. A valve is opened and the brakes on the freight are set. This might be sufficient to avert the disaster, but the engineer, unaware of the drama taking place behind him, continues to bear down on the throttle. This pressure applied at both ends of the train can cause the coupling gear between cars to shatter, with the result that the train breaks into two sections with often disastrous results. The damage to equipment and loss of time from such occurrences have cost the railroads many millions of dollars over the years.

In these days of rising operating costs and diminishing profits, there is hardly a railroad which is not investigating every means of eliminating needless expenses. In addition, competition from other forms of

In the locomotive the handset is placed within easy reach of the engineer.

Railroad radio in the yards. A switch engine crew talks with the dispatcher.



transportion has brought about speeded up schedules and the demand for more and more service to shippers.

The new CRC system provides one answer to the problem. For example, the Northern Pacific reports that since the installation of the radio system on one stretch of their road, they save one hour out of eight and cut down accidents as well. Multiply this by similar experiences on other parts of the line, add the more efficient handling of mechanical failures, plus the increased safety, and the result equals a substantial saving to any railroad.

Centralized Radio Control, or CRC, is the direct result of experiments performed by Bendix engineers immediately following World War II. In a series of tests conducted at that time, in cooperation with four major railroads, a successful modification of the war-famed SCR-522 airborne transceiver was perfected, and for the first time VHF communications were made available to the railroads. One of the first railroads to avail themselves of the new communication form was the Northern Pacific. As early as 1945, the NP made an installation which was used to eliminate difficulties experienced during the blizzards which regularly disrupted communications in the Cascade mountains.

For the next few years, Bendix, and other manufacturers who subsequently entered the field, continued to perfect the equipment and many significant advances were made. Portable two-way radios were added as auxiliary equipment, increasingly greater ranges were obtained, and such features as increased selectivity and adjacent channel operation became standard for railroad use.

It was obvious to many railroad people as well as Bendix engineers, however, that railroad radio was not providing the maximum service of which it was capable. Many radio installations were confined to semi-emergency types of operation such as substitution for ordinary means of communication during storms or other unexpected crisis, or synchronizing the throttles of two diesels pushing and pulling the same train. These were justifiable functions of radio, and railroad communication people in general were appreciative of the dependence which they could place on their VHF equipment, but still, there was room for improvement.

In 1948, F. L. Steinbright, Superintendent of Communications for the Northern Pacific arranged to borrow some equipment from Bendix for a series of experiments leading up to an overall integrated system. Units were placed on locomotives and cabooses spotted throughout the system in an effort to locate any dead spots, places where the radio wouldn't work. There were none. As a result, Steinbright ordered six sets to be set up in the St. Paul area, convenient to the headquarters of the Northern Pacific. Here train crews were taught the operation of the equipment and instructions were given maintenance personnel. By 1949, the Northern Pacific had their first engine to caboose system in operation and as a result of their experiments, were convinced of the advantages as well as the possibility of expanding the program so that dispatchers and telegraphers along the line could be included in the network. The answer was Centralized Radio Control.

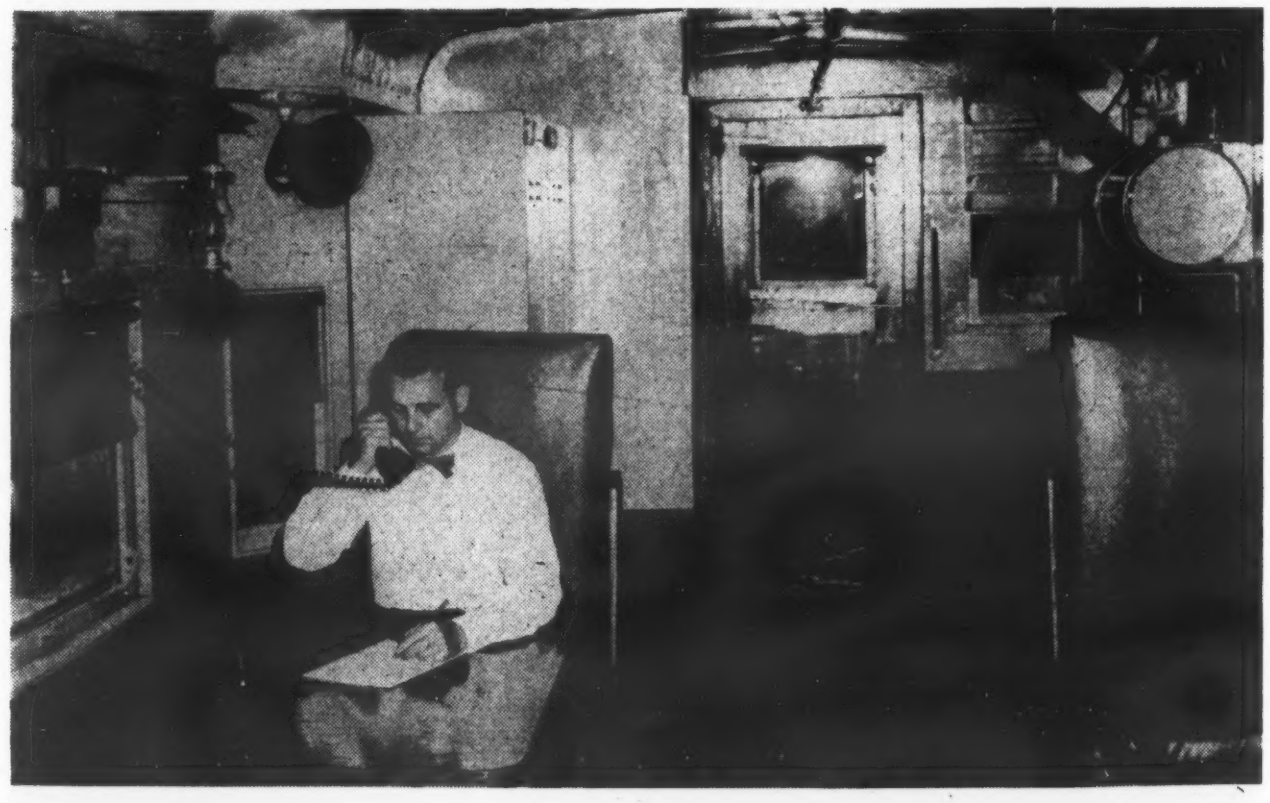
In designing the CRC system, Bendix engineers had to take into consideration the many variables which would be encountered with different railroads. To be of any value, the CRC system had to be readily adaptable to any railroad, no matter what the extent of its trackage, the condition of the terrain, or the weather conditions encountered. In the case of the Northern Pacific, the two immediate problems which presented themselves were the necessity to conserve and merge into the system the existing communication facilities such as telephone circuits, and provision for operation of waystations which were "unattended" during a portion of the day. In addition, the railroad right-of-way ran

Control unit for installation in the caboose or locomotive.

through mountainous terrain with elevations ranging from 900 to 1500 feet, which necessitated the strategic placing of antennas and waystations.

The Northern Pacific installation cost some $200,000 in addition to the years of design and experimentation, but now in operation, it is successful, even beyond the fondest dreams of its creators.

Caboose installation. Radio equipment is located in closet behind operator.



OPERATION

Basically, CRC is nothing more than a series of transceivers, strategically located along the railroad right-of-way and bridged upon the existing dispatchers telephone circuit to provide a completely integrated system of communications. By making use of unitized construction in such things as the Line Bridging Unit, and the Line Keyer, the system has been made completely flexible. For instance, it is possible to install a CRC system providing only

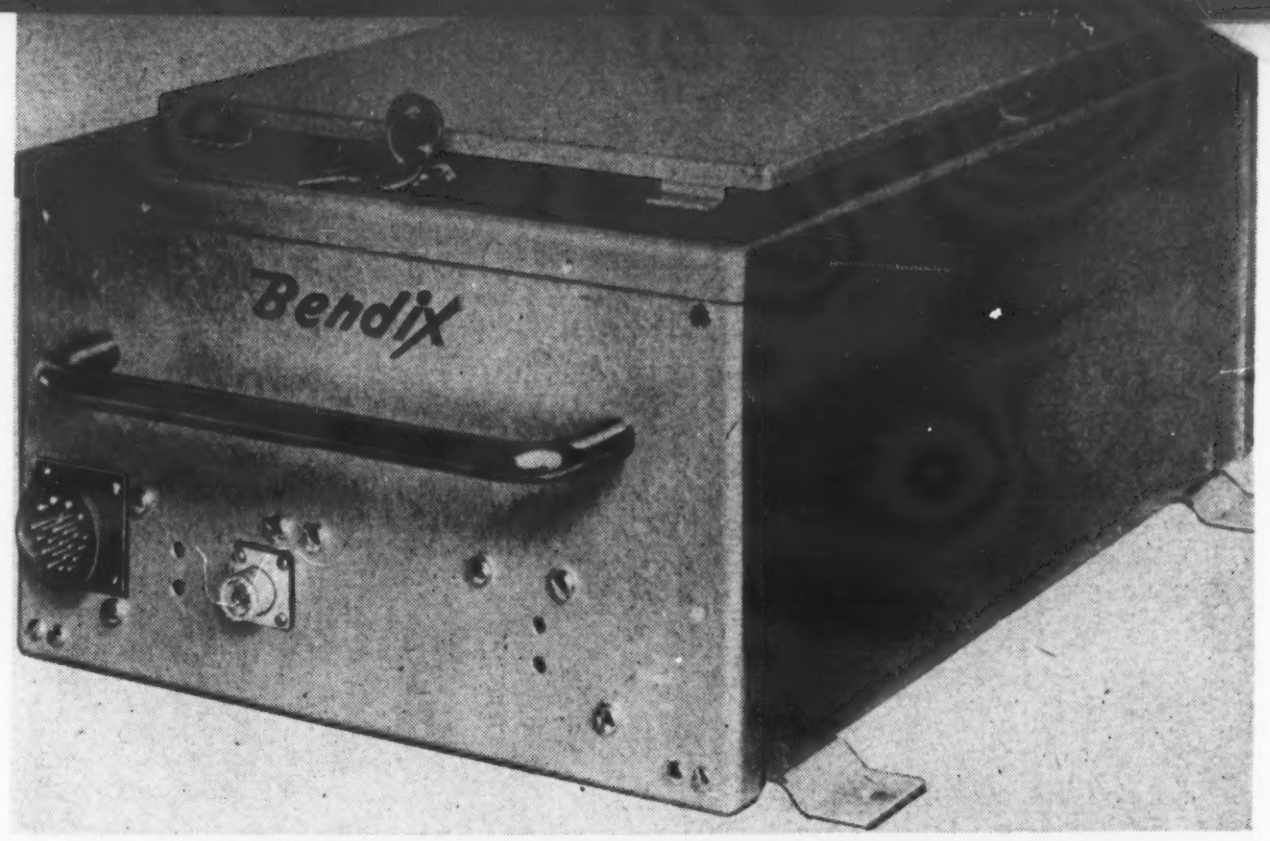
limited functions, and to expand it at a later date without obsoleting that portion already installed. CRC is equally adaptable to long line railroads as well as those whose track mileage is not as extensive. It makes use of standard package units which may be arranged in various combination to meet the specific requirements of any railroad.

One of the more unique features of the CRC system is the use of attended or unattended waystations. This is of particular value wherein a railroad prefers not to man the various waystations for a full twenty-four hour period. Previous railroad communication systems have not had this feature, with the result that when no one was in attendance at the waystation, the portion of the radio system covered by that particular station ceased to operate. This often nullified the benefits which resulted from the installation of radio systems and was one of the first requirements specified by the Northern Pacific in their initial request.

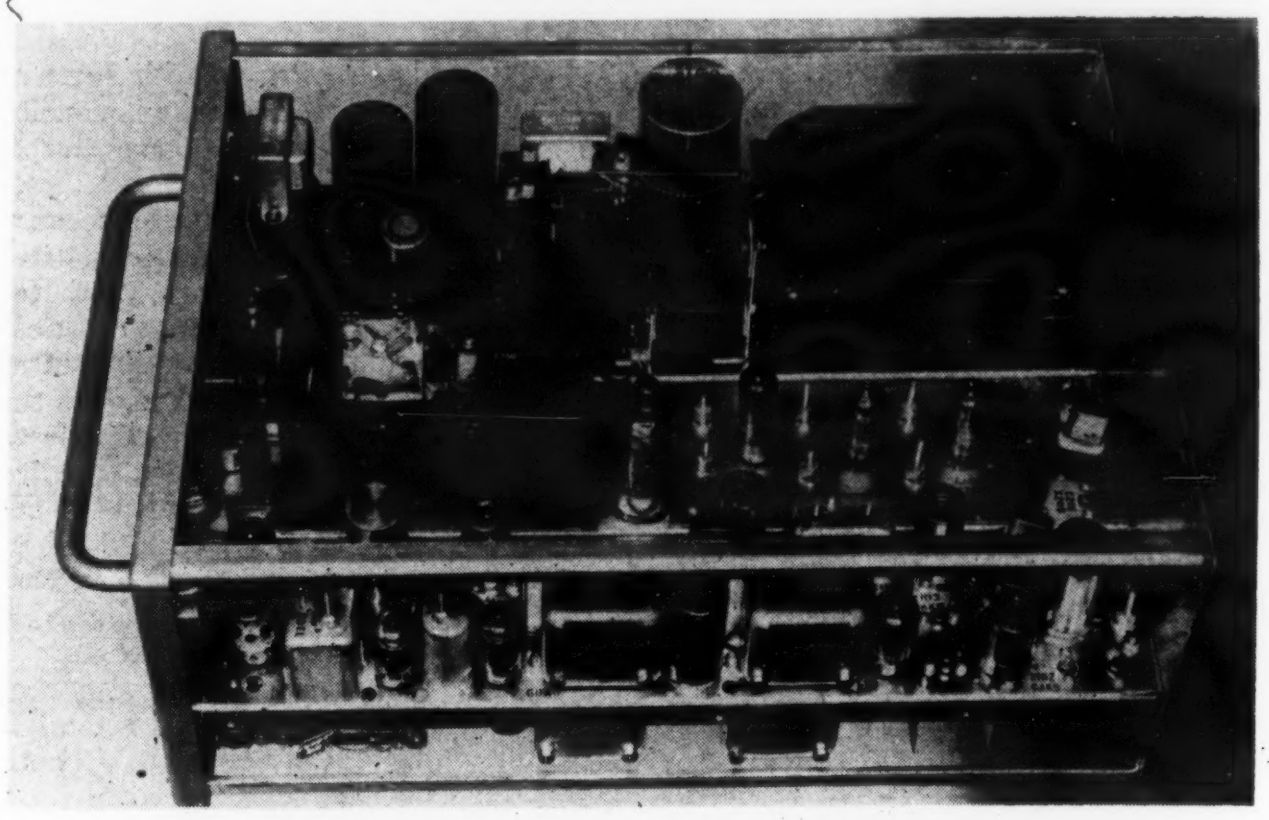
With the CRC system, waystations can be operated either manually or automatically. If a conductor on a train wants to talk by radio to the dispatcher, he calls the operator at the nearest waystation and asks to be connected through to the dispatcher. The waystation operator then throws a small toggle switch which connects the waystation radio to the dispatcher's telephone circuit. Conversely, if the dispatcher wishes to contact a train, either moving or stationary, he uses a selector key to call the waystation exactly as if he were making a normal call by telephone circuit. The waystation operator throws the toggle switch connecting the dispatcher's line to the radio.

Regardless of whether the call is initiated by the dispatcher or the train, the dispatcher, in order to activate the distant radio must first close a telephone-type key switch on his desk. This serves to modify his "press to talk foot switch," so that when this switch is pressed an audio tone goes out over the line to "key" the transmitter at the remote station. As he releases his foot switch the radio reverts to receiving.

When the dispatcher finishes his conversation, he restores his key switch to normal to prevent the pulse tones from going out over the line. When he uses his foot switch again, the regular telephone circuit will be activated. The small key switch is the only additional item of equipment for the dispatcher to use when adding the CRC system to the previous telephone train dispatching system.



Above: The "Trafficmaster," another version of the radio transmitting and receiving equipment. Electrically indentical to the "Railmaster" but packaged in a single case. Below: Uncovered unit.



When the telegraph or waystation operator finishes his tour of duty and his station is to be closed for the remainder of the twenty-four hour period, he throws a red flagged toggle switch from "Manual" to "Automatic". From then on, calls from the dispatcher to the train can be made automatically, with the waystation transmitter going on the air upon receipt of the pulse tone initiated by the dispatcher. When the conductor in the caboose of a train wishes to hold a conversation with the dispatcher, he pushes a button marked "Dispatcher" which causes a similar audio tone to be transmitted. At the nearest waystation this tone connects the radio equipment to the dispatchers telephone circuit. The connection is maintained until the interchange of conversation has been completed at which time the waystation is automatically disconnected from the dispatcher's line.

New uses for the CRC system are being discovered every day. In addition to the normal functions of providing communication between distant points, one railroad is experimenting with its potential use in the performance of remote functions such as the raising and lowering of crossing gates. It is possible, for instance, to arrange to have the engineer of a train raise a gate which he is approaching by pressing a button in the cab of his locomotive. When the area has been passed, he can press another button and the gate will be lowered, or the button can be located in the caboose, so that the latter function can be performed by the conductor. Undoubtedly more and more ways of using this new system will be developed as the many tests which are now under way prove more conclusively that railroad radio communications are one means of providing more efficient operation of today's railroads.

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• ***Address by the Hon. John R. Floberg, Asst. Secretary of the N***

GENTLEMEN:

I would like to say first of all what a great pleasure it is to be here and what an honor I consider it to have been invited to be your speaker. I know that, so far as membership in your distinguished association is concerned, the Navy might be described as the junior partner, and so it is particularly gratifying to have this chance to address you.

Always in the presence of a group such as yourselves who are experts in a special field, the non-technical man feels somewhat at a loss. To talk about communications in generalities is like talking about the "World Today" or any other subject so broad in concept that you could speak for a week as readily as for fifteen minutes.

Because communications is everywhere, it is the triumph, technically, of the modern world, and also the key to its tragedy. The vast achievements in radar and electronics are the triumph; the failure of one-half of the world to establish any reasonable human communication with the other is the tragedy.

And, incidentally, one of the attempts to bridge that tragedy is through radio attempts to penetrate the Iron Curtain. These attempts are a marriage of the technical achievements, the mechanic of communication as it were, and the message of a free world trying to get through to those in chains.

Public relations is communications, too, in a very real sense. It has come to occupy an important part in industry and in the Armed Services because the public wants to know about the product they buy or the Defense Program they are asked to support. Faulty communications result when the information supplied to the various media is imperfect or inadequate.

But I do not feel qualified to talk on the technical subject like communications to you who are specialists in it and in some cases have devoted your entire adult lives to it. Rather I thought I would talk on a subject which is very important to me and, in my opinion, to the country. It is a subject which is widely misunderstood—due, I suppose, to a sort of breakdown of communications.

That subject has to do with some of the military capabilities and deficiencies of your Navy's and Marine Corps' areonautical elements.

This subject is appropriate because this meeting tonight comes at a time when world conditions are. and for some time have been, close to critical and when the people of your country and mine are prepared to recognize the danger which faces them. I believe that most of our fellow-citizens are alive to the peril of the times and want the Military Establishment to take whatever steps are necessary to offer at least the minimum guarantee of being able to perform its primary missions.

First of all let me assure you that your Navy and Marine Corps, are, within the limits of their over-all strength and the modernity of their equipment, in a high state of readiness. Their morale is high; their training is good; their consciousness of purpose is complete; their missions are well understood; and their devotion to peace is characteristically American.

These forces do, however, have their deficiencies even though those deficiencies are remediable. I thought I would skip completely today the question of over-all strength and focus upon one particular aspect of the modernity of the Fleet's equipment, namely her post World War II aircraft carrier situation.

In this year 1952 there seems to me to be an over optimistic reconciliation with world events in the fact that the backbone of the American Navy is the pre-World War II designed ESSEX class of carriers, and it obviously is impossible to accept that class of ships permanently as the central structure upon which American control of the seas must depend. And yet, with the exception of the three MIDWAY class ships, designed and all but completed during World War II, those ships are the fundamental instruments available to the Navy to perform its mission.

A gentleman whom I regard as one of the most intelligent, energetic, influential, and best informed in Washington was quoted to me the other day —I hope incorrectly—as saying that no other fleet in the world could challenge ours for control of the seas and that, therefore, he saw no particular problem in postponing construction of the second FORRESTAL class carrier for a year.

The reason I say I hope the man was quoted incorrectly is that any such statement indicates total lack of broad appreciation of the Navy's primary mission and of the true meaning of the term control of the seas.

This quoted statement typifies the rather widely assumed fallacy that control of the sea equals invincibility in fleet actions, or stated another way, that sea power equals sea combat and extends only to the high water mark of the world's oceans. Nothing could be farther from the truth.

American sea power, in the first place, is a part of the totality of American military power; it must be adjudged in terms, not just of the number of seagoing units of any potential enemy, but, like our other military forces, in terms of the totality of military power of that potential enemy. The quality and quantity of naval combat aircraft and of the ships from which they fly cannot be simplified into some necessarily fixed relation to the enemy ships and aircraft which they oppose: rather the quality and quantity of naval combat aircraft and aircraft carriers is a function of the missions which the Naval Establishment will be called upon to perform.

Reflect for a moment on the fact that roughly three-fourths of the earth's surface is covered by salt water. Reflect further on the additional fact that the commerce of the world moves across its seas, and that our national survival depends on the continuation, and therefore the protection, of that commerce everywhere on those seas; partial protection will not suffice.

Reflect further on the huge land mass which is the Soviet Union. Because of

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y of the Navor Air, before the AFCA 1952 Convention

their geographical location and gives the assumption of the offensive advantage which the aggressor always enjoys, the Soviets could put themselves in a position to interdict shipping in the Atlantic, Mediterranean, Persian Gulf, Indian Ocean and the Pacific Ocean without so much as launching a surface ship.

Reliance on a fleet of submarines and a fleet of aircraft would enable the Communists to cause serious embarrassment to us who depend, not just for our military capacity but for our economic survival, on the accessibility of raw materials over all these seas—many of these raw materials so critical that effective interference with their supply would change our whole way of life.

Yet there seems to be a possibility that the Navy may be denied what I consider the most omportant single tool for the accomplishment of its primary mission.

As you all know, the inclusion of funds for the construction of a second FORRESTAL class aircraft carrier in the 1953 Appropriation Bill is in jeopardy. Far be it for me to question the principle of economy in government: rather I believe that the record of the Navy since World War II conclusively demonstrates an ability to achieve military miracles with a minimum of money. At the same time, however, I believe that first things come first. I fail to see how we can logically as a nation undertake a program of investing billions of dollars in overseas bases and overseas-based forces and then hesitate to invest a relatively small fraction of those billions in the instruments most essential to making those bases tenable and those forces supportable.

And I say "instruments" in the plural, because I believe that the program of ten FORRESTAL class carriers to which the Secretary of the Navy recently referred has just one thing questionable about it—I doubt that we can afford, unless there is some miraculous and material change in the Soviet attitude toward the rest of the world, to build those ships at as slow a rate as one a year. Certain it is that the cost of all ten of those vessels, substantial through it obviously will be, will not amount to much compared to a complex of land bases, and certain it also is that those ships will never either become attached to foreign real estate nor dependent on the volition of any other nation for their employment.

It must never be forgotten that not one single foot soldier or one single land based aircraft can be based overseas on anything other than a sacrificial basis unless the Navy is in a position to guarantee the support of that man or that airplane.

This is no insignificant guarantee. Time does not stand still in Communists' technological progress; the growth in quality and quantity of the Soviet air and submarine threat to our ability to keep open the sea lanes for ourselves and deny them to others demonstrates that fact. And yet time is standing still for us if we do not keep a steady flow of modern equipment into the fleet.

Because military capabilities are not absolute but are relative to those of potential adversaries they are never stable. .Either they are improving or they are degrading, and even while improving absolutely they may be degrading relatively. The conversion, for example, of World War II ships is a most important part of the Navy's program and greatly increases the capabilities of those ships and, therefore, of Navy. The question, however, is not as simple as whether or not those capabilities are increasing, but if whether or not they are increasing correlatively with the growing difficulty and importance of performance of the Navy's mission.

Every time there is either a qualitative or quantitative improvement in Soviet submarine capabilities—and we all know that they have over 300 submarines in commission as compared to the approximately three score with which the Germans began World War II—or in their aircraft—and we know they have many thousands of high quality machines—or in any other relevant capability of the Soviet—the intensity of the Navy's responsibility for both making sure that our ships will continue to ply the seas and for driving potential enemy shipping from the seas is reduced unless we either match or surpass this increase in Soviet capability.

There have been some suggestions in the press and elsewhere that the comparative cost of a fast carrier task force with land based strategic bombers argues against increasing the Navy's carrier strength. The logic and economics of every one of these comparisons that I have seen are completely inaccurate, but I am not even going to dwell on that point because I do not believe it has anything to do with the question at hand. The missions of the two types of forces are almost completely mutually exclusive.

The Navy's responsibility for maintaining control of the sea is recognized in the National Security Act of 1947 and in the subsequent delineation of roles and missions between the services; it focuses the Navy's primary efforts on the conduct of prompt and sustained operations at sea, including the operation of sea based aircraft and their land based air components so that general sea supremacy can be gained and maintained and so that local superiority, including air superiority, can be gained and maintained in any area of Naval operations. The Navy's mission puts actual combat forces and the direct support therof, such as ships, shipyards, submarines, submarine yards, aircraft and airfields, etc., in the forefront of attention. Strategic bombardment, with which it is sometimes confused, on the other hand, has the mission of destroying the enemy's war making capacity, a term which primarily includes such things as key manufacturing systems, raw material sources, stockpiles, communication facilities, vital agricultural areas, concentrations of uncommitted forces and similar targets.

The capability of performing primary missions can, of course, give a service secondary capabilities, limited in varying degrees by many such variables as geography and in this sense each service complements the other. The capability of cooperation on land and sea and in the air, however, must not be confused with duplication.

So the question is not one of choosing between carrier task forces, on the one hand, and land based strategic bombers on the other; rather the question is one of choosing between fast carrier task forces on the one hand, and loss of control of the sea on the other. We are at a critical point in making the decision to resolve that dilemma, and we all know enough about Soviet capabilities to know that we cannot take a chance on another year of contemplative idleness in which to hope that some supernatural change will take place in the fundamental eco-

(*Continued on page* 76, *col.* 1)

Air Force Notes

Major R. J. Hennessy
USAF

Officer Candidates

Major General Raymond C. Maude, Director of Communications at U.S. Air Force Headquarters in Washington, announced this week that he expects all his senior communicators in the various commands to take the lead in encouraging outstanding young officers to apply for consideration for regular, or permanent commissions. General Maude stressed the importance of stimulus from senior communicator level stating, "I would appreciate a most active response and participation and interest in this officer procurement program." The Air Force Director of Communications also stressed the great need for a growing Corps of Reserve officers to match communications-electronics requirements in an expanding Air Force. He has placed great emphasis upon senior officers to screen their outstanding non-commissioned and commissioned people for possible advancements commensurate with their abilities and potential in the C-E specialty.

The Maintenance Engineering and Installation Branch of the Air Force Directorate of Communications has been transferred from the Director of Maintenance and Engineering under the Deputy Chief of Staff for Materiel at Air Force Headquarters. The Branch will now function under the Communications and Radar Division of the Materiel Directorate. This will affect matters pertaining to Air Materiel Command and the Airways and Air Communications Service Installation Squadrons.

1953 AFCA Convention

The U.S. Air Force Communications Directorate has already launched preliminary plans for next year's Armed Forces Communications Association convention. In a letter to the senior communicators in the commands this week, General Maude has asked the field to supply ideas which will form the basic mode of approach for the 1953 AFCA get together at Dayton, Ohio. The plan apparently is to make the 1953 the best yet!

New AF Communications-Electronics Publication

The worldwide fraternity of Air Force Communications and Electronics personnel will welcome the announcement by Major General Raymond C. Maude, alerting the field to a forthcoming consolidated publication of USAF Communications-Electronics Instructions (CEI).

The CEI volume will encompass within one file drawer a spread of instructions covering every facet of the C-E art. Broken into five major sections, the CEI, in 3,500 printed pages, will treat communications-electronics doctrine, procedures, systems, planning and equipment for field specialists down to Wing level.

Designated to eliminate the need for time wasting (and often fruitless) search for publications guidance, the CEI will also reduce to one file, all the written material specialists require to function efficiently in command and staff capacities in this work.

The publication is a two-year product of the Manuals Branch of the Electronics Division at the Air University at Maxwell AFB, Alabama. It was guided to completion by Colonel Lawrence C. Sheetz, Electronics chief there, and Lt. Colonel W. T. Judkins, who heads the Manuals Branch for the Air Command and Staff School, at Maxwell.

The CEI will not eliminate the need for the familiar tech orders but is designed to augment them for those who require broad staff and command guidance in this rapidly expanding field of Air Force effort.

The Government Printing Office is publishing the documents, which will be delivered complete with file folders. Distribution to the field is set for mid-summer from headquarters U. S. Air Force Security Service at Brooks AFB, Texas.

The CEI file is described in detail in AFR 5–44, dated 4 April 1952.

US-Canadian Maneuver

Headquarters Air Force has announced a joint US-Canadian maneuver for July of this year under the title "Exercise Signpost." The exercise will be a function of the Air Defense Command at Ent Air Force Base, Colorado. It will cover the entirety of Canada, the U.S. and outposts of these. It has as its objective the coordination of air defense forces of the two nations. It will offer an opportunity to evaluate status and techniques of hemispheric security against air attack. New equipment and the efficiency of manpower will also come under the scrutiny of observers during the maneuver. Participating units will probably include the Air Forces of both nations, AAA and Ground Observer Units and Radar and Control Centers from both sides of the Canadian border.

Air Force Tech Committee

A recent abolishment of the Air Force Technical Committee will not mark the end of inter-Service liaison in technical matters and the exchange of information on these subjects. Air Force headquarters has announced that the Air Research and Development Command with Headquarters in Baltimore, Maryland, will continue to maintain a free flow of information to the Army and Navy and the various elements of the other services.

Major General Maude has dispatched word to all his field communicators that SIGNAL magazine will accept and use pictures and stories concerning Air Force communications-electronics matters. He has encouraged field communicators to pass information to SIGNAL via command Public Information Officers to 1624 Eye Street, NW, Washington, D. C., in the interest of exchange of info with other Services.

Airborne Ultra High Frequency training on the AN/ARC-27 started out at Scott Air Force Base this month on unmodified versions of the set. The Collins Radio Corporation will attempt to supply modified sets for this training prior to the start of the second class next month.

From the President

In this message, Wally Watts talks to the chapter presidents and other chapter officials regarding plans for their meetings and programs for the coming fall and winter.

With this issue of SIGNAL, I should like each of you to give renewed thought to the purposes of the AFCA and the opportunities for their accomplishment at the local chapter level. For, as I said in my last message, if we do not make the local chapter a vital, living organization, dedicated to and really accomplishing the Association's mission, we cannot make that contribution to the National welfare, whether in peace or war, which the founders of the Association visualized and to which our membership is committed.

At this time when we should all be making our plans for activities during the coming Fall and Winter I feel that this thought is particularly timely. Worthwhile programs, much planning, real work, and time are required. If your chapter is one of those not usually active during the Summer, why not plan to at least have a luncheon meeting to lay some real ground work for the coming season?

In seeking to extend our membership and thus our influence, I think it essential to remember that we must constantly strive to make the local program so outstanding and so informative that individuals not participating will feel that they are missing something really worthwhile. This is the way, and the only way, we can build ourselves up at the local chapter level. Be sure that new members, both group and individual, are welcomed into your chapter and made to feel that they are a definite part of our organization.

In arranging our programs, I think it important to remember the assistance that our magazine SIGNAL can offer. To better serve the local chapters, the editors of SIGNAL have greatly enlarged the "Chapter News" section. In the last issue this section covered twelve pages. I want to urge all of the chapters from the largest to the smallest to take constant advantage of this facility. To the chapter Program Committees at the local level I strongly recommend "Chapter News" as a source of information and suggestion in planning their own activities.

There is a final thought that I feel we should all keep before us—the current defense effort offers us an unparalleled opportunity to develop and solidly cement the relations between the military services and industry so that they may be carried over on a firm and continuing basis to the time when, it is to be hoped, we can devote our major energies to peace rather than to defense.

Thank you for the many letters I received in response to my first message. They were most encouraging, and well demonstrate the kind of interest and enthusiasm that is so essential to the continuing success of the AFCA.

W-W-W atts

ASSOCIATION AFFAIRS

COMMUNICATIONS • ELECTRONICS • PHOTOGRAPHY

Service Academy Awards

The association's annual awards at Annapolis and West Point this year were SX-71 Hallicrafters communications receivers donated by William J. Halligan, president of Hallicrafters Company and immediate past president of the AFCA.

Robert John Michaels of North Wales, Pa., won the AFCA award at the Naval Academy for the highest standing in the electronics course. An enlisted man for 34 months before entering the academy on a fleet appointment in 1948, Midshipman Michaels graduated third in his class of 783 with a four-year average of 89.77 per cent. During his senior year, he served as commander of the First Battalion, with the rank of midshipman lieutenant commander, and later as commander of the Third Company with the rank of midshipman lieutenant; earned varsity letters in soccer, was manager of the varsity rifle team and a member of the choir.

Midshipman Michaels was commissioned an ensign and after graduation leave reported for duty aboard the Atlantic Fleet destroyer USS GOODRICH.

The prize was presented on behalf of the association by Ernest Kohler, Jr., manager of the Washington office of the Hallicrafters Company. (See cover photo.)

Harry L. Van Trees, Jr., of Kansas City. Mo., was the recipient of the AFCA award at the Military Academy for the highest rating in the study of electricity. Cadet Van Trees graduated as the number one man in his class of 529. He was active in the West Point Debate Council, a member of the German Club, and during his senior year served as a cadet lieutenant.

In addition to the AFCA award, Cadet Van Trees was awarded eight other prizes for the following achievements: number one man of his class; highest ratings in mechanics; military topography and graphics; chemistry; physics; military engineering and military history; and military psychology and leadership.

Upon graduation, Cadet Van Trees was commissioned a 2nd lieutenant, Armor, USA.

The AFCA award presentation was made by Robert F. Halligan, son of Hallicrafters President Halligan, who was at West Point to attend the fifth reunion of his class.

Robert F. Halligan, left, presents AFCA award to West Point's Lt. H. L. Van Trees, Jr.

1952 Awards to ROTC

The demand for the AFCA awards to outstanding ROTC cadets has steadily increased, with 67 colleges and universities participating in the program during the 1951-52 academic year. Reports from the many Military, Naval and Air Science Departments concerned indicate that these awards are held in high esteem and are promoting greater incentive among the students.

This year's award winners are as follows:

A & M College of Texas

Bob Chapman, SigC—gold medal. Cadet lt. col.; electrical engineering major; AIEE.

James H. Mims, AF—silver medal. Electrical engineering major; vice-pres. Texas A&M Radio Club; AIEE; operates college radar installation.

Mark W. Worley, SigC—silver medal. Veteran; bus. admin. major; rifle club; pres., Pershing Rifles; Clarkson Guards.

Harry J. Glass, SigC—bronze medal. Elect. engr. major; veteran.

Clemson Agricultural College

Donald B. Salley, SigC—gold medal. Cadet capt.; mech. engr.; amateur radio operator.

James F. Callaham, SigC—silver medal. Cadet sgt.; elect. engr.; rifle team.

William L. Bross, SigC—bronze medal. Cadet cpl.; elect. engr.; Pershing Rifles.

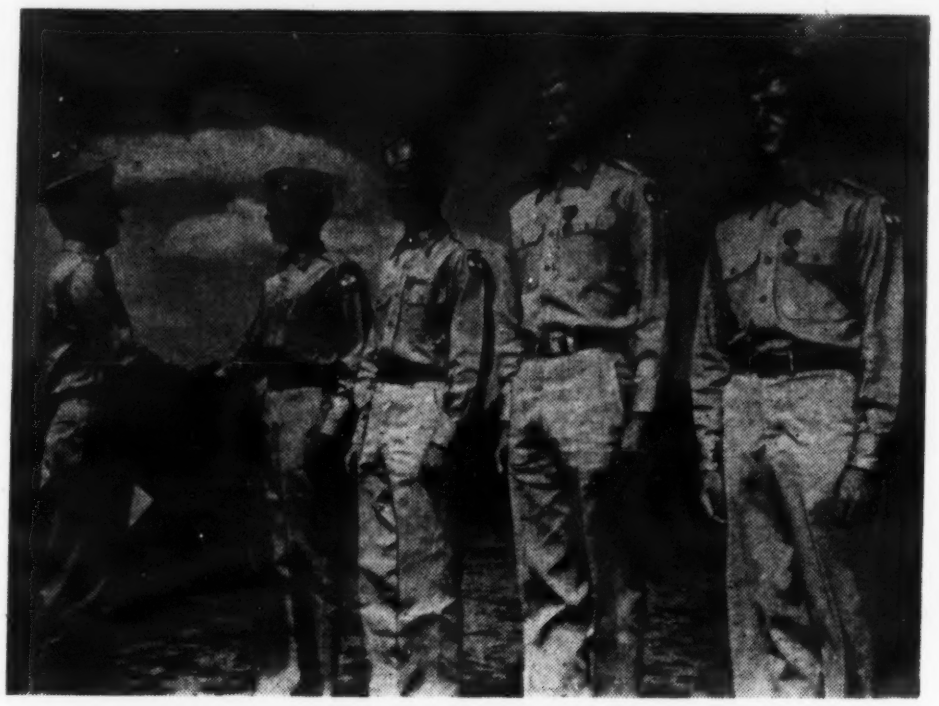
Cornell University

Charles W. West, Jr., SigC—gold medal. Elect. engr.; vice pres. Engineering College Student Council; Eta Kappa Nu; Scabbard and Blade; Pi Delta Epsilon; Varsity Managers' Club.

John V. Wiseman, AF—silver medal. Elect. engr.; amateur radio.

Gerald M. Bloom, SigC—bronze medal.

Lt. Col. Simon A. Stricklen congratulates Cadet Carver G. Kennedy the outstanding Signal Corps Cadet at Alabama Polytechnic Institute, who was awarded the US Veteran Signal Assoc. medal. L-R: Jack A. Johnson, AFCA gold medal; Julius F. Gunter, AFCA silver medal; Dale R. Koehler, AFCA bronze medal.



Alabama Polytechnic Institute

Jack A. Johnson, SigC—gold medal.
Julius F. Gunter, SigC—silver medal.
Dale R. Koehler, SigC—bronze medal.

Carnegie Institute of Technology

John Luchok, SigC—gold medal. Cadet major; Scabbard & Blade; Pershing Rifles; Metals Club: American Society of Metallurgy; Varsity "C" Club; commissioned 2nd lieutenant Ordnance Corps.

Robert G. McKie, SigC—silver medal. Cadet lt.; elect. engr.; Scabbard and Blade; Pershing Rifles.

John E. Laynor, SigC—bronze medal. Elect. engr.; student council; Cameron Choir; Alpha Phi Omega; Pershing Rifles; Scabbard and Blade.

The Citadel

Albert C. Malacarne, Engineers—gold medal.

Franklin R. Dulany, Jr., Ordnance—silver medal.

Louis F. Williams, Jr., Engineers—bronze medal.

Clarkson College of Technology

Richard J. Larkin, SigC—gold medal. Management-personnel major. Omicron Pi Omicron.

Elect. engr.; pres., Kappa Nu.

Georgia Institute of Technology

Charles R. Quentel, AF—gold medal, Cadet col.; elect. engr.; Tau Beta Pi, Phi Eta Sigma, Eta Kappa Nu, Pi Delta Epsilon, Phi Kappa Pi; Scabbard and Blade; Omicron Delta Kappa; AIEE.

Joel G. King, Jr., SigC—silver medal. Cadet m/sgt.; elect. engr.; distinguished military student; Scabbard and Blade; vice pres. AIEE; Tau Beta Pi, Eta Kappa Nu, Theta Chi.

Robert C. Dancy, SigC—bronze medal. Cadet cpl.; elect. engr.; Alpha Tau Omega, Phi Eta Sigma.

Iowa State College

Edward J. LaFleur, AF—gold medal. Cadet major; elect. engr.; veteran 3 years with Air Force.

Sherlock A. Johnson, SigC—silver medal. Cadet sgt. 1/c; electr. engr.; Scabbard and Blade; Sigma Chi; president Engineering Council; AIEE-IRE.

David T. Friest, Navy—bronze medal. Elect. engr.; Phi Eta Sigma, AIEE, IRE, Order of the Sextant, Iowa State College marching band; circulation mgr. "Iowa Engineer."

Kansas State College

Otis L. Cox, SigC—gold medal. Cadet capt.; distinguished military student.

Earl R. Bullock, SigC—silver medal. Cadet sgt.; Scabbard and Blade; radio amateur; distinguished military student.

Jerome L. Hartke, SigC—bronze medal. Amateur radio; audio engr.

Lehigh University

Malcolm A. Bingaman, AF—gold medal. Cadet capt.; elect. engr.; distinguished military student and distinguished military graduate; Psi Upsilon; engineering honor societies; on active duty at Wright-Patterson AFB as electronics development officer, Air Research and Development Command.

William T. Spencer, AF—silver medal. Cadet sgt.; physics major; Ski Club, Dramatics Club, Glee Club, Chapel Choir, Newtonian Society.

Herman E. Keifer, III, AF—bronze medal. Elect. engr.; president, Lehigh U. Radio Club.

Marquette University

Roy U. Morrison, Navy—gold medal. Midshipman 1/c; NROTC yearbook photographer; commissioned ensign and assigned to U.S.S. BREMERTON.

Massachusetts Institute of Technology

Robert M. Oliver, SigC—gold medal. Nuclear physics major; Delta Tau Delta.

Charles W. Poppe, AF—silver medal. Cadet m/sgt.

William J. Eccles, SigC—bronze medal. Elect. engr. major.

Michigan State College

William W. Miller, SigC—gold medal. Cadet lt. col.; physics major; Scabbard and Blade; past national commander, Pi Tau Pi Sigma; distinguished military student.

Allan G. Bower, SigC—silver medal.

AFCA GROUP MEMBERS

Communications—Electronics—Photography

Listed below are the firms who are group members of the Armed Forces Communications Association. By their membership they indicate their readiness for their share in industry's part in national security. Each firm nominates several of its key employees or officials for individual membership in AFCA, thus forming a group of the highest trained men in the electronics and photographic fields, available for advice and assistance to the armed services on research, development, manufacturing, procurement, and operation.

Acme Telectronix
Admiral Corporation
Allied Radio Corporation
Almo Radio Company
Altec Lansing Corporation
American Cable & Radio Corp.
American Electroneering Corp.
American Institute of Electrical Engineers
American Phenolic Corporation
American Radio Relay League
American Steel & Wire Company
American Telephone & Telegraph Co.
Anaconda Wire & Cable Company
A. R. F. Products, Inc.
Andrews Corporation
Argus Cameras, Inc.
Arnold Engineering Company
Astatic Corporation
Audio Products Corporation
Automatic Electric Company
Automatic Electric Sales Corp.
Baltimore News Post
Barry Corporation, The
Bell Telephone Company of Pa.
Bendix Radio
Bergsma Brothers
Bliley Electric Company
Breeze Corporation
Burnell & Company
California Water & Telephone Co.
Capitol Radio Engineering Inst., Inc.
Cargo Packers Inc.
Carolina Telephone & Telegraph Co.
Central Radio and Television Schools
Chesapeake & Potomac Tel. Co.
Churchill Cabinet Co.
Cincinnati & Suburban Bell Tel. Co.
Collins Radio Company
Columbus Process Co., Inc.
Copperweld Steel Company
Cornell-Dubilier Electric Corp.
Corning Glass Works
Coyne Electric School, Inc.
Croname, Inc.
Crosley Division-Avco Mfg. Corp.
C. R. Daniels, Inc.
Diamond State Telephone Co.
Drake Manufacturing Co.
Dukane Corporation
DuMont, Allen B., Laboratories, Inc.
Eastman Kodak Company
Electronic Associates, Inc.
Elgin Metalformers Corporation
Espey Manufacturing Co., Inc.
Federal Mfg. and Engineering Corp.
Federal Telephone & Radio Corp.
General Aniline & Film Corp.
General Cable Corporation
General Electric Company
General Instrument Corp.
General Insulated Wire Works, Inc.
General Telephone Corp.
General Transformer Co.
Gilfillan Bros., Inc.
Globe Wireless, Ltd.
Graflex, Inc.
Gray Manufacturing Co.
Guardian Electric Mfg. Co.
Hallicrafters Company
Haloid Company
Hazeltine Electronics Corp.
Heinemann Electric Company
Hercules Motor Corp.
Hoffman Radio Corp.
Hughes Aircraft Company
Hycon Manufacturing Company
Ilex Optical Co.
Illinois Bell Telephone Co.
Indiana Bell Telephone Co.
Institute of Radio Engineers
International Business Machines
International Resistance Co.
International Tel. & Tel. Corp.
Jacobsen Manufacturing Co.
James Knights Co., The
Kellogg Switchboard & Supply Co.
Kester Solder Company
Kleinschmidt Laboratories, Inc.
Lavoie Laboratories
Leich Sales Corporation
Lenkurt Electric Company, Inc.
Lenz Electric Manufacturing Co.
Lewyt Corporation
Loral Electronics Corporation
Machlett Laboratories, Inc.
Magnavox Company
Majestic Radio & Television, Inc.
Mallory, P. R., & Co., Inc.
Martin, Glenn L., Company
Merit Transformer Corp.
Michigan Bell Telephone Company
Motorola, Inc.
Mountain States Tel. & Tel. Co.
Muter Company, The
National Cash Register Co.
National Company, Inc.
New England Tel. & Tel. Co.
New Jersey Bell Telephone Company
New York Telephone Company
Northwestern Bell Telephone Co.
Oak Manufacturing Co.
Ohio Bell Telephone Co.
O'Keefe & Merritt Company
Pacific Mercury Television Mfg. Corp.
Pacific Telephone & Telegraph Co.
Philco Corporation
Photographic Society of America
Pickering & Company, Inc.
Pioneer Electric & Research Co., The
Platt Electronics Corporation
Precision Apparatus Co., Inc.
Radiart Corporation
Radio Condenser Company
Radio Corporation of America
RCA Victor Division
Raymond Rosen Engineering Products, Inc.
Ray-O-Vac Company
Raytheon Manufacturing Company
Reeves Instrument Corp.
Remington Rand, Inc.
Saxonburg Potteries
Seeburg, J. B. Corporation
Sherron Electronics Co.
Shoup Engineering Company
Shure Brothers
Simmon Brothers, Inc.
Society of Motion Picture Engineers
Sonotone Corporation
Soundscriber Corp.
Southern Bell Tel. & Tel. Co.
Southern New England Tel. Co.
Southwestern Bell Telephone Co.
Sperry Gyroscope Company
Sprague Electric Company
Stackpole Carbon Company
Standard Coil Products Co., Inc.
Standard Transformer Corp.
Stewart-Warner Corporation
Stupakoff Ceramic & Mfg. Co.
Sylvania Electric Products, Inc.
Technicolor Motion Picture Corp.
Telegraph Apparatus Co., Inc.
Telephone Services, Inc.
Telephonics Corporation
Teletype Corporation
Times Facsimile Corporation
Transmitter Equipment Mfg. Co.
Tung-Sol Lamp Works, Inc.
United Radio Television Institute
United States Rubber Company
United Telephone Co.
Utah Radio Products Co., Inc.
Voltz Brothers, Inc.
Waterman Products Co., Inc.
Webster-Chicago Corporation
Wells Sales, Inc.
West Coast Telephone Co.
Western Electric Company, Inc.
Western Union Telegraph Co.
Westinghouse Electric Corp.
Weston Electrical Instrument Corp.
Wickes Engineering & Construction Co.
Willard Storage Battery Company
Wisconsin Telephone Company
Wollensak Optical Company
York-Hoover Corporation
Zenith Radio Corporation

1952 AFCA – ROTC Awards

Cadet 2nd lt.; speech and radio major; Tau Sigma; science and arts honorary society; Alpha Epsilon Rho, natl. radio and television honorary.

John O. Cheney, SigC—bronze medal. Cadet squad leader; elect. engr.; technician for WKAR, college radio station; AIEE; amateur radio club; Student congress.

Montana State College

Gary V. Graves, AF—gold medal. Cadet capt.; squadron commander; industrial engineering major.

Charles W. Evans, AF—silver medal. Electrical engineering major.

Newark College of Engineering

Ned B. Sluyter, AF—gold medal. Cadet lt. col.; elect. engr.; veteran 3 years' service in Navy.

Edward W. Mowle, AF—silver medal. Cadet capt.; elect. engr.; amateur radio operator.

New York University

Albert W. Charmatz, SigC—silver medal. Cadet 1st lieut.; chairman, student branch IRE; corres. secy., Eta Kappa Nu; Tau Beta Pi.

Roger Berry, SigC—bronze medal. Cadet m/sgt.; president; NYU Heights Photographic Society; rifle team; two-time winner NYU photographic salon; won third prize in AFCA-SigC 1951 photo contest.

North Carolina State College

Wesley O. Doggett, AF—gold medal. Cadet lt. col.; Scabbard and Blade, Phi Eta Sigma, Phi Kappa Phi, Tau Beta Phi; secy. senior class.

Richard L. Quickel, SigC—silver medal. Cadet lt.; elect. engr.; Scabbard and Blade, Sigma Phi Epsilon, Tau Beta Phi, Phi Eta Sigma.

Frank A. Hargrove, AF—bronze medal. Cadet s/sgt.; Phi Eta Sigma; track team; outstanding freshman ROTC student 1951.

Norwich University

Richard S. Conde, SigC—gold medal. Cadet capt.; also won awards of U. S. Vet. Sig. Corps Assoc. and Am. Society of Mechanical Enginers; Newman Club, Outing Club and Radio Club; organized Norwich Signal Honor Platoon.

Roderick R. Howe, SigC—silver medal. Cadet 1st sgt.; commander, Signal Honor Platoon; president, Lambda Chi Alpha; president, Norwich Radio Club; distinguished military student.

Jack A. Lucido, SigC—bronze medal. Cadet cpl.; Sigma Alpha Epsilon; German Club; Newman Club; circulation mgr. "Magnum"; varsity football.

David W. Luce, SigC—bronze medal. Cadet cpl.; Signal Honor Platoon.

Ohio State University

James M. Swiger, SigC—gold medal.
George F. Nosek, SigC—silver medal.
Earl R. Murphy, SigC—bronze medal.

Oklahoma A&M College

Paul B. Redding, SigC—gold medal. Cadet capt.

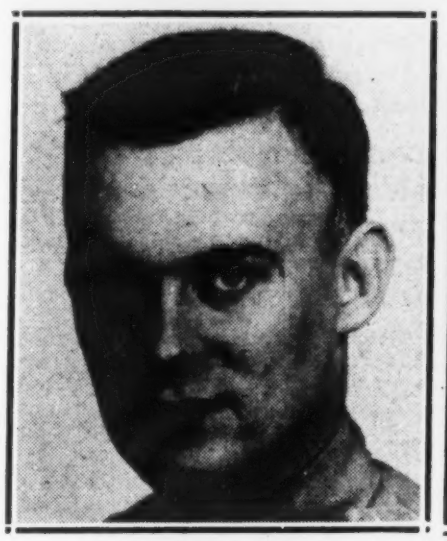
Glenn R. Elliott, SigC—silver medal. Cadet 2nd lt.

Joe B. Flowers, SigC—bronze medal.

Milan G. Simons, Texas A&I, AFCA silver medal.

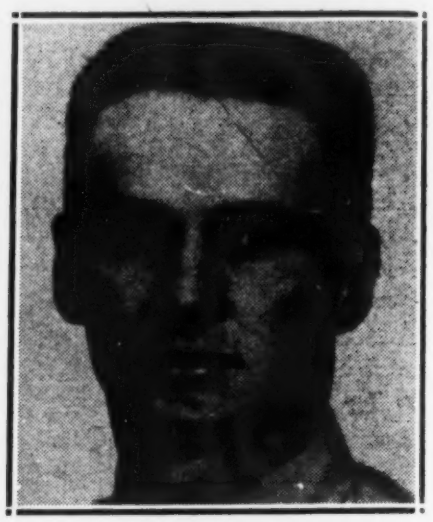
William F. Cowant, Texas A&I, AFCA bronze medal.

Daniel G. Dow, University of Michigan, AFCA silver medal.



Jerome L. Hartke, Kansas City University, AFCA bronze medal.

David T. Friest, Iowa State College, AFCA bronze medal.



Earl R. Bullock, Kansas State College, AFCA silver medal.

Gordon Lofquist, University of Michigan, AFCA gold medal.

Allen G. Bower, Michigan State College, AFCA silver medal.

Vincent Damrouskas, University of Michigan, AFCA bronze medal.

Robert Chapman, Texas A&M, AFCA gold medal.

John V. Wiseman, Cornell University, AFCA silver medal.

Richard L. Quickel, North Carolina State College A&E, AFCA silver medal.

The personalities, voices, and faces of well-known men and women are now—through television—a part of daily life in 17 million homes.

Celebrities come calling on them every day!

Few of us, until just recently, ever came face to face with celebrities or shared—as eye-witnesses—in events of great national interest. But now, in homes everywhere, millions of us are "visited" daily by the world's great artists, entertainers and statesmen.

Television, with its timely, pictorial coverage, brings us news, sports, and world events *as they happen*. Its spreading networks are a rich source of entertainment to more and more people across the nation.

RCA, through its research and engineering, contributed substantially to the advance of television—just as it did in radio broadcasting and world-wide radio communications. Among major RCA advances have been: the image orthicon television camera, kinescope picture tube . . . and now, the new RCA Victor super TV sets with "Picture Power"—for the clearest reception possible, wherever you live.

* * *

See the latest in radio, television, and electronics at RCA Exhibition Hall, 36 West 49th Street, New York. Admission is free. Radio Corporation of America, RCA Building, Radio City, New York 20, New York.

RCA

RADIO CORPORATION OF AMERICA

World leader in radio—first in television

AFCA ROTC AWARDS

Cadet Cpl. William R. Colvin, Texas Tech., AFCA bronze medal.

Cadet S/FC James R. Relyed, Texas Tech., AFCA silver medal.

Maj. General Finch, USAF presents Air Force Commission to Ned B. Sluyter, Newark College of Engineering. Prior to this Lt. Sluyter was awarded AFCA gold medal. Lt. Col. David B. Tudor looks on.

University of Texas; Cadet Robert E. Smith, AFCA bronze medal; Cadet Maj. David Zink, II, AFCA gold medal; Cadet 2nd Lt. Hershell J. Wood, AFCA silver medal.

Col. Melie J. Coutlee, PAS&T presents Joseph F. Albers, University of Notre Dame, with AFCA gold medal.

University of Tennessee; Colonel Lawrence C. Shutz, Commandant, Electronics Division, Air Command & Staff School, Air University, congratulates (Left) George A. Bradfute, AFCA gold medal award winner and Ray H. Farmer, AFCA silver medal winner.

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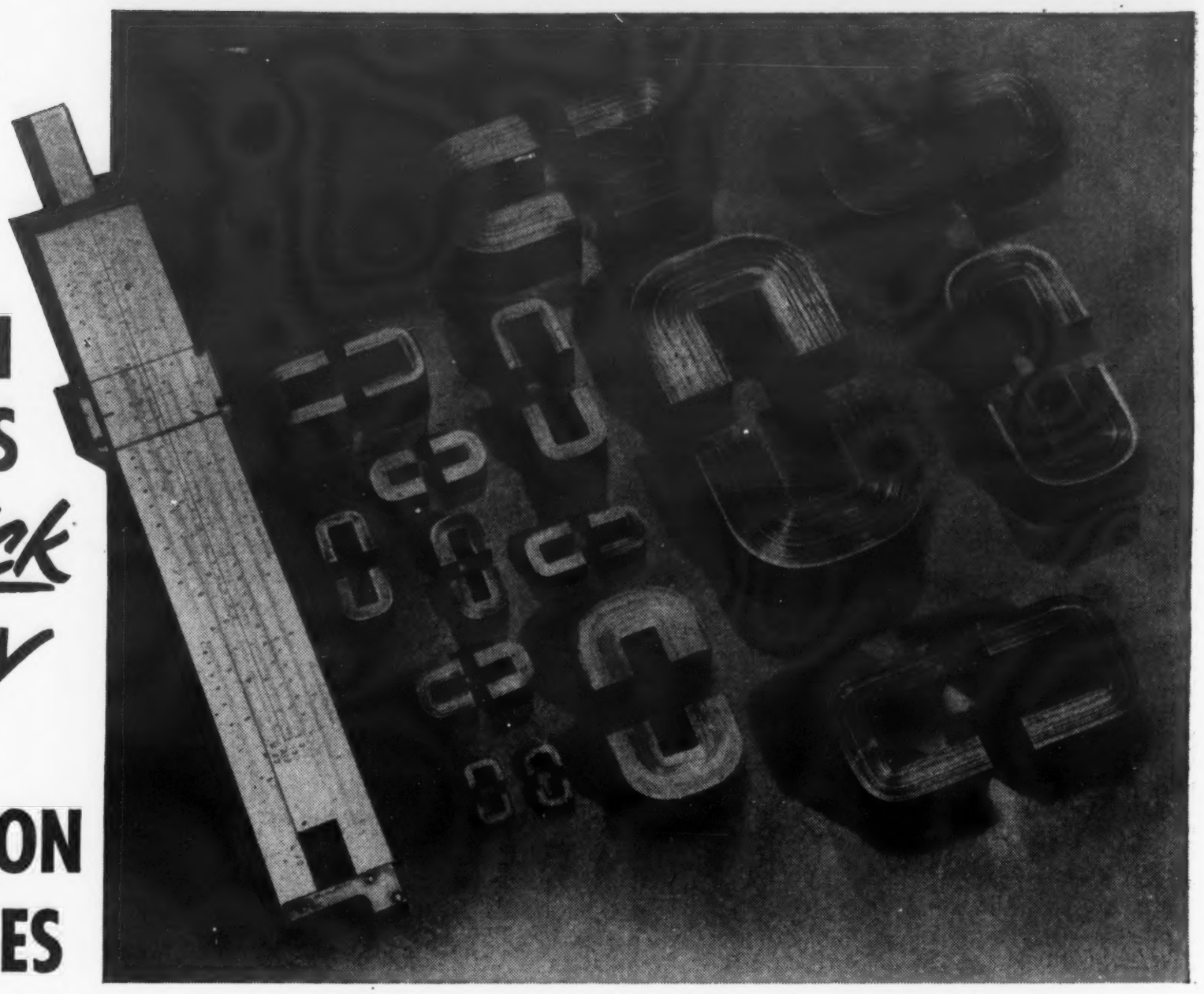

SILECTRON "C" CORES *for quick delivery* IN PRODUCTION QUANTITIES

. . . wound from strip as thin as 0.00025"

Quality-Tested and Proved

★ Arnold "C" Cores are made to highly exacting standards of quality and uniformity. Physical dimensions are held to close tolerances, and each core is tested as follows:

★ 29-gauge Silectron cut cores are tested for watt loss and excitation volt-amperes at 60 cycles, at a peak flux density of 15 kg.

★ 4-mil cores are tested for watt loss and excitation volt-amperes at 400 cycles, at a peak flux density of 15 kg.

★ 2-mil cores are tested for pulse permeability at 2 microseconds, 400 pulses per second, at a peak flux density of 10 kg.

★ 1-mil cores are tested for pulse permeability at 0.25 microseconds, 1000 pulses per second, at a peak flux density of 2500 gauss.

★ ½ and ¼-mil core tests by special arrangement with the customer.

Now available—"C" Cores made from Silectron (oriented silicon steel) thin-gauge strip to the highest standards of quality.

Arnold is now producing these cores in a full range of sizes wound from ¼, ½, 1, 2 and 4-mil strip, also 29-gauge strip, with the entire output scheduled for end use by the U. S. Government. The oriented silicon steel strip from which they are wound is made to a tolerance of plus nothing and minus mill tolerance, to assure designers and users of the lowest core losses and the highest quality in the respective gauges. Butt joints are accurately made to a high standard of precision, and careful processing of these joints eliminates short-circuiting of the laminations.

Cores with "RIBBED CONSTRUCTION"* can be supplied where desirable.

Ultra thin-gauge oriented silicon steel strip for Arnold "C" Cores is rolled in our own plant on our new micro-gauge 20-high Sendzimir cold-rolling mill. For the cores in current production, standard tests are conducted as noted in the box at left—and special electrical tests may be made to meet specific operating conditions.

● We invite your inquiries.

*Manufactured under license arrangements with Westinghouse Electric Corp.

W&D 4211

THE ARNOLD ENGINEERING COMPANY

SUBSIDIARY OF ALLEGHENY LUDLUM STEEL CORPORATION

General Office & Plant: Marengo, Illinois

CHAPTER NEWS

Retiring President of the Baltimore chapter, Col. Henry Williams, congratulates newly elected president, George C. Ruehl, Jr.

Augusta-Camp Gordon

Ralph Grist, general coordinator of military services for Southern Bell Tel. & Tel. Co. and AFCA southeastern area representative, was guest speaker at the chapter's June 4th meeting.

"Free enterprise has been the formula for success in American business for 100 years," Mr. Grist emphasized, "and it will continue to be the formula 100 years from now if we have the good sense to hold on to the freedom of opportunity largely responsible for making America the most productive land in the world."

Mr. Grist pointed out the importance of business ownership, and how one out of every six adults in America puts his savings into business and, finally, earnings put to work one way or another buy the research and more efficient equipment which means lower prices and more customers. He also described the growth of the telephone business which started out merely as an idea and eventually became one of the biggest industries in the world.

The meeting was held in the officers club at the Augusta Arsenal, with a social hour preceding the dinner. Chapter President Charles Eberhart of Southern Bell Tel. & Tel. introduced the guests present and called on each member to introduce himself and state his civilian or military occupation. The president then gave a report on the AFCA national convention which he had attended in Philadelphia in April.

Baltimore

The election of new officers for the coming year closed the Baltimore Chapter's activities for the summer. The officers will be installed in September when the chapter resumes full-scale activities.

Heading the slate as president will be George C. Ruehl, Jr., of George C. Ruehl Advertising, with other officers as follows: vice-presidents—Col. A. H. Anderson, Baltimore Signal Depot; Col. J. D. Dreyfus, Fort Meade; Capt. H. R. Demerest; D. C. Lee, Westinghouse Electric Corp.; secretary—Plummer Wiley, Chesapeake & Potomac Telephone Co.; treasurer—Albert Busch, Bendix Radio.

Boston

Colonel Serig, vice commander of the Air Force Cambridge Research Center, was scheduled to be the main speaker at the chapter's June 12th meeting. A report of the meeting will be carried in Sept.-Oct. SIGNAL.

Chicago

James H. Kellogg, president of Kellogg Switchboard & Supply Co., was elected president of the Chicago Chapter at the annual elections on May 16th. Vice-presidents are: William C. DeVry, Carrington Stone, Fritz Franke and C. G. Duncan-Clark; secretary-treasurer—Raymond K. Fried, who will be serving his third term in this office. Chapter directors: Oliver Read (director for life), Bennett Cooke, Theodore Gary, John Howland, Frank Meade, Samuel Todd, O. G. Smith and Ray Johnson.

Held jointly with the I.R.E., the meeting featured as guest speaker Robert E. Lang, Director of Radio Free Europe, who described its purpose, equipment, and operation with the aid of a 16mm motion picture.

Atlanta Chapter meeting. L-R: Maj. Cochran, Secty-Treas; Maj. L. B. Sullivan, speaker of the dinner meeting, and P. C. Curry, chapter President.

Ladies from Atlanta General Depot at the AFCA dinner meeting held at Fort McPherson, Ga., Third Army Hdqs. With the ladies is Robert J. Smith, Vice President of the Atlanta Division of the Atlanta Chapter.

Following the meeting, the members and guests divided into groups interested in one of four concurrent sessions on the following subjects: Empire State antenna; generation and transmission of color TV; flight instrumentation; application of electronics to nuclear science.

Dayton-Wright

A detailed report on the national convention in Philadelphia, illustrated with slides of the highlights of the event, was presented at the chapter's May 29th meeting by President Paul Clark. General plans for the 1953 convention in Dayton were discussed, with preliminary arrangements to be drawn up in the fall with representatives of the Air Force, which will stage the technical portion of the convention at Wright Field.

George Meyer, chairman of the nominating committee, presented a slate of officers for the 1952-53 chapter year, which was unanimously chosen as follows: president—Paul H. Clark, RCA Victor Div., vice-presidents—George B. Meyer, Westinghouse Electric Corp.; P. J. Deluhery, Admiral Corp.; Col. Steve J. Gadler, Wright Field; secretary—Lucille Althoff, RVA Victor Div., treasurer—David L. Pearlstone, RCA Victor Div.; directors—Harry C. Blackburn, Maj. F. L. Hart, Louis Herz, William H. Hine, Howard W. Ingle, Lt. Col. H. W. Lanford, Jr., R. J. McIlrath, Roy Merwin, Brig. Gen. Clyde H. Mitchell, Gunnar Nelson, Brig. Gen. P. W. Smith, Capt. Walter F. Stebbins and William E. Thresher.

The chapter organization was completed at a special meeting of the officers and directors on June 18th when the following committees were appointed: program and entertainment—John E. Wilkinson, chairman; Frank Demchock, member; membership—W. L. Van Zant, chairman; Capt. J. W. DeBeau and A. F. Schmahl, members; industrial—H. C. Blackburn, chairman; publicity—G. Louis Herz, chairman; liaison—A. S. Lord, chairman; armed forces—Maj. A. R. Bonner, chairman; reserve affairs—William Coffin, chairman.

The chapter's first annual picnic was a bang-up success. Held on June 21st at the Twin Oaks Camp in Hills and Dales, 125 members and guests enjoyed a very pleasant outing until the weatherman decided to end the festivities with a rainstorm at 6:30 P.M. A quartet was on hand to entertain with barbershop melodies, beer and soft drinks were plentiful and there was an abundance of good food.

A raffle was conducted during the course of the afternoon and approximately $300.00 was raised which was earmarked for chapter funds in connection with the 1953 national convention in Dayton. Several beautiful prizes, including an Admiral portable radio, a Sylvania clock radio, an RCA table radio and a Westinghouse super waffle baker, were awarded the lucky ticket holders.

Prizes were also awarded to the two winners in the recent membership drive. The $50 savings bond was won by William L. Van Zant for bringing in the most new members, and the $25 bond went to Capt. J. W. DeBeau for second place.

John Wilkinson, chairman of the entertainment committee, and Col. Horace Lanford, are to be commended for the time and effort put forth toward making the picnic such a success. Credit also goes to Col. Richard Amann and his communication WAFs who did such an outstanding job of selling the raffle tickets, and to Chapter Secretary Lucile Althoff who, in addition to her other duties, wielded a mean serving spoon.

Left to Right: Col. John Brocico, Agusta-Camp Gordon Chapter Vice President; Chas. M. Eberhart, Chapter President; Col. S. R. Stribling; Ralph Grist, guest speaker; John Owen, Chapter Secty. This June meeting was well attended.

Decatur

Continually in demand by AFCA chapters, Howard Van Zandt of Kellogg Switchboard & Supply Co. delivered his lecture on "Adventures in Telecommunications in Japan" at Decatur's April 10th meeting and met with the same interest and enthusiasm which has marked the audience response at each of the chapters he has visited.

Plans for the electronics training course which the chapter is sponsoring at the Decatur Signal Depot were reported at the May 22nd meeting by Herman Tille, chairman of the chapter's industrial relations committee. The course is scheduled to start in September and will be open to all employees of the depot and members of the chapter. The course will be supervised and directed by the civilian personnel office of the Decatur Signal Depot. The chapter is especially grateful to Col. Frank Schaal, commanding officer of the depot, for his interest and cooperation in developing this project. A separate building will house the training area and a

Decatur meeting, left to right: Mr. Cupp Inspection Officer; Mr. Badgett, Secty-Treas., Chapter II; Colonel Schall, CO Decatur Signal Depot; Harold Van Zandt, Kellogg Switchboard and Supply Co.; Louis Yack, President, Decatur Chapter.

"ham" shack. As soon as the course is under way in the fall, the chapter plans to sponsor a civil defense mobile communication truck as its next project.

William Thomson, chairman of the membership committee, reported that membership had more than tripled in the last five months. To encourage further growth and interest, it was decided to award lapel pins to chapter members recruiting new members. A bronze pin will be presented to each member recruiting three new members, a silver pin for five new members, and a gold pin for ten new members.

At the close of the business session, E. W. Cupp, chairman of the meetings committee, showed the film "Coast to Coast Flight of a DC-6 Airliner." The film was in color and highlighted the scientific, mechanical, and cockpit procedures used by United Airlines for dependable air transportation. Specially constructed housing for the camera under the tail assembly resulted in spectacular scenes never seen by passengers. The film vividly emphasized the elaborate and vital communication equipment required in air transportation.

Ninety-four members and guests attended the meeting and the social hour which preceded it at the officers mess of the depot. President Louis Yack opened the meeting with a report on the national convention in Philadelphia.

Detroit

The principles of operation of the synchrotron were explained to chapter members on May 22nd by Prof. H. R. Crane of the Physics Department of the University of Michigan. A visit to the synchrotron laboratory followed the lecture in the Harrison M. Randall Laboratory of Physics at the University.

Among the 72 members and guests present were Major George E. Rippey, SigC Asst. PMS&T, University of Michigan, and the senior ROTC students of the Signal Corps unit. Prior to the meeting, a number of members attended dinner at the Michigan Union.

The chapter's April meeting featured a talk on "Adventures in Re-

National Director of Chapters: Maj. Gen. George I. Back

AREA REPRESENTATIVES FOR CHAPTERS

Area A: George W. Bailey, IRE, 1 E. 79th St., New York, N. Y. *New England States, New York, New Jersey*

Area B: J. H. LaBrum, Packard Building, Philadelphia, Pa. *Delaware, Kentucky, Maryland, Ohio, Pennsylvania, West Virginia and Virginia*

Area C: Ralph S. Grist, So. Bell T&T Co., Atlanta, Ga., *Southeastern States along Atlantic and Gulf coasts—from North Carolina to Louisiana including Tennessee*

Area D: E. H. Mittanck, 711 Telephone Bldg., Dallas, Tex. *New Mexico, Texas, Oklahoma, Arkansas*

Area E: T. S. Gary, 1033 W. Van Buren St., Chicago, Ill. *Michigan, Indiana, Illinois, Wisconsin, Minnesota, Iowa, Missouri, Kansas, Nebraska, North Dakota, South Dakota, Wyoming, Colorado*

Area F: *Harry E. Austin, 28 Geary St., San Francisco, Calif. Arizona, Utah, Nevada, California, Idaho, Oregon, Montana and Washington*

CHAPTERS: PRESIDENTS AND SECRETARIES

ATLANTA: President—P. R. Curry, 969 Rosedale Rd., N. E., Atlanta, Ga. Secretary—Ralph P. Wooten, 820 Forrest Rd., N.E., Atlanta, Ga.

AUGUSTA-CAMP GORDON: President—Charles Eberhart, Southern Bell T&T, 937 Greene St., Augusta, Ga. Secretary—John W. Owen, Southern Bell T&T, 937 Greene St., Augusta, Ga.

BALTIMORE: President—George C. Ruehl, Jr., 2024 Maryland Ave., Baltimore, Md. Secretary—Plummer Wiley, 2906 Silver Hill Ave., Baltimore, Md.

BOSTON: President—Paul F. Hannah, Raytheon Mfg. Co., Waltham, Mass. Secretary—Louis B. Dunham, Franklin Tech. Inst., 41 Berkeley St., Boston, Mass.

CHICAGO: President—James H. Kellogg, 6650 So. Cicero Ave., Chicago, Ill. Secretary—Raymond K. Fried, 111 W. Monroe St., Chicago, Ill.

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SACRAMENTO: President—Paul W. Carrington, 1100 Lochbrae Rd., No. Sacramento, Calif. Secretary—C. A. House, Sacramento Signal Depot, Sacramento, Calif.

SCOTT-ST. LOUIS: Col. William N. Snouffer, PO Dr No. 772, Scott AFB, Ill. Secretary—Allen L. Eisenmayer, P.O. Box 356, Trenton, Ill.

SAN FRANCISCO: President—Col. Lloyd C. Parsons, SigSec, Hqs Sixth Army, Presidio of San Francisco, Calif. Secretary—William G. Damerow, 1625 Pacheco St., San Francisco.

SEATTLE: President—Frank D. Keyser, 1415 E. Olive St., Seattle, Wash. Secretary—Merrill R. Stiles, 916 W. 122nd, Seattle, Wash.

SOUTH CAROLINA: President—Capt. Henry H. McCarley, USN, Qtrs "LL," US Naval Base, Charleston, S. C. Secretary—Carl A. Newman, 2807 Monroe St., Columbia, S. C.

SOUTHERN CALIFORNIA: President—Arthur C. Hohmann, Rm 83, City Hall, Los Angeles, Calif. Secretary—Richard F. Walz, 303 Marine Ave., Manhattan Beach, Calif.

WARREN, F.E.-CHEYENNE: President—Lt. Col. Norman Fertig, Qtrs. 116, F.E. Warren AFB, Cheyenne, Wyo. Secretary—Thomas Rhoads, 2117 Pioneer, Cheyenne, Wyo.

WASHINGTON: President—Joseph R. Redman, Western Union, 1405 G St., N.W., Washington, D. C. Secretary—James F. Coll, Western Union, 1405 G St., N.W., Washington, D. C.

STUDENT CHAPTERS

CORNELL UNIVERSITY, Ithaca, N. Y.

NEW YORK UNIVERSITY, New York, N. Y. President—Roger Berry. Secretary—Edward Abelowitz.

OHIO STATE UNIVERSITY, Columbus, O. President—Raymond E. Spence, Jr.; Secretary—Robert Borden.

OKLAHOMA A & M COLLEGE, Stillwater, Okla.

PURDUE UNIVERSITY: Lafayette, Ind. President—Allan Borken; Secretary—Stanley S. Kershaw, Jr.

STATE COLLEGE OF WASHINGTON, Pullman, Wash.

TEXAS TECHNOLOGICAL COLLEGE, Lubbock, Texas. President—Charles I. Powell. Secretary—Don Mears.

UNIVERSITY OF ALABAMA: University, Ala.

UNIVERSITY OF CALIFORNIA, Berkeley, Calif.

UNIVERSITY OF ILLINOIS: Urbana, Ill. President—Donald A. Jackson; Secretary—Milton F. Langer.

UNIVERSITY OF VIRGINIA: President— Robert L. Dean; Secretary—Walter S. Moore.

UTAH STATE AGRICULTURAL COLLEGE: Logan, Utah.

National Headquarters Chapters Secretary: Julia B. Godfrey

mote Control" by Keith A. Regel, manager, industrial sales, Automatic Electric Company.

Far East

A talk on communications in Japan by Mr. Numoto, Vice President of the Nippon Electric Company, featured the March 13th meeting of the Tokyo Post of the Far East Chapter. Mr. Numoto covered the historical growth of telephones in Japan from several hundred in 1890 to 1,400,000 today and pointed out that the industry now has seven major telephone manufacturers.

Photography as a means of military communication was described by Major Clarence G. Welcher and Capt. Robert L. Strickland. A display of combat photographs was shown and Capt. Strickland reported some of his experiences with combat photography in Korea.

A program committee was appointed as follows: Maj. D. E. Myers, USAF, FEAF, chairman; J. M. Roche, SigSec, GHQ, FEC; M/Sgt. William Indseth, Co. A, 71st SigSv Bn.

A Board of Directors of the Tokyo Post was elected on May 14th as follows: Brig. Gen. Elton F. Hammond, Signal Officer, FEC; Col. Frederick G. Moore, USAF, 1808th AACS Wing; Cdr. E. L. Battey, USN, Com NavFe; James M. Roche, SigSec, Hq, FEC; Joseph B. Austin, Jr., SigSec, Hq, FEC; Col. Robert W. Paulson, USAF, Hq, FEAF.

Mr. Dimitri Boria, of the photographic laboratory, SigSec, Hqs, FEC, gave an authoritative talk on color photography. He showed some outstanding color transparencies and prints made in the laboratory on the Korean conflict and scenes in Japan, and his explanation and demonstration of how color photographs are made were extremely interesting.

Major August C. Mahon, USAF, chief of the electronics division, directorate of communications, FEAF, followed with an illustrated talk on "Air Traffic and Ground Control of Aircraft in Korea and Japan."

The program concluded with the showing of films taken of the May Day riots in Tokyo.

Kentucky

"Communications in Relation to our Normal Lives" was the subject of a talk before the May 14th luncheon meeting by A. A. Abraham of the Radio Equipment Co., Lexington. The speaker pointed out that the field of communication had of necessity expanded to keep step with progress made in many other fields, such as electronics, aviation, automobiles, etc.

Dr. Howard Van Zandt, assistant sales manager of Kellogg Switchboard and Supply Company, addressed the May 28th luncheon meeting on "Adventures in Telecommunications in Japan," citing many of his experiences while attached to the civil communications section on General MacArthur's staff.

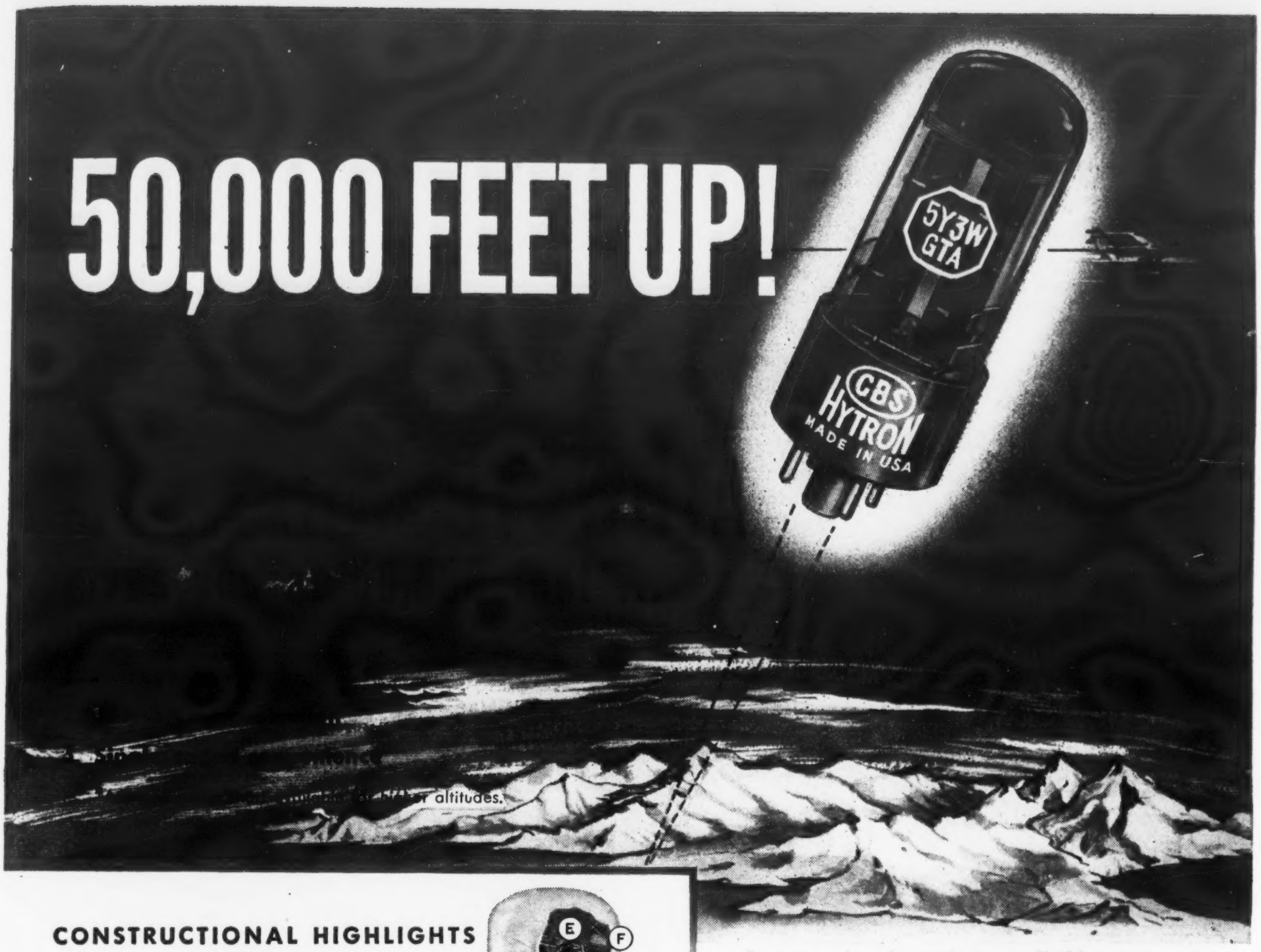
Since he could travel without an interpreter, Dr. Van Zandt was sent to look into telecommunications problems in all forty-six prefectures of Japan—one of very few foreigners to make so thorough a coverage of the Mikado's Empire. He compared the terrain of Japan to Central Pennsylvania, through the Allegheny Mountains, and said he believed there are places in Japan white men have never seen.

He stated that, while Japan has the best telephone system in the Orient, it is so cumbersome and slow that it is usually quicker and more satisfactory to send a messenger than to call a person by telephone. In the larger offices there are "professional dialers," who do nothing but dial telephones, and with practice they can complete dialing a number in 15 minutes, where it takes the average Japanese an hour to dial the same number.

Below left: Tokyo Post, Far East Chapter January meeting held at the Union Club. Officers elected at this meeting, L-R: Capt. G. A. Barnes USAF, Treas.; Lt. Col. R. M. Johnson, Sig. Section GHQ FEC, Secty.; Lt. Col. W. Heskett, CO 71st Sig. SV BN, HQS & SV Comd, GHQ FEC, Chairman of AFCA Chapter. Col. G. B. Hoffman FEAF Dir. of Communications, 1st Vice Chairman; and Lt. R. L. Scarborough, COMNAVFE, 2nd Vice Chairman AFCA.

Below right: March meeting (L-R) Capt. G. A. Barnes, FEAF; Maj. Clarence G. Welcher, Lt. Col. Marcus W. Heskett, Mr. Minoru Numoto, Vice President, Nippon Electric Co., Tokyo; Capt. R. L. Strickland, Photo Branch, 71st Sig. SVC, BN., Sig. Cec, GHQ, FEC.

Lower left: May meeting in the Union Club, L-R: Brig. Gen Elton F. Hammond Signal Officer, FEC, and Commander E. D. Batty, COMNAVFE, attended. Right hand photo below, L-R: Lt. Col. Marcus W. Heskett, chairman; and Lt. Col. Robert M. Johnson, Secty; at the speakers table.

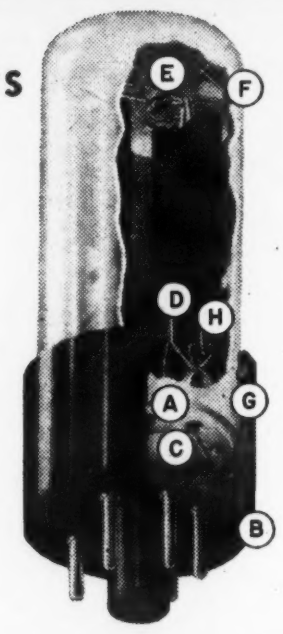


altitudes.

CONSTRUCTIONAL HIGHLIGHTS 5Y3WGTA

For high altitudes: A. Cavity stem (patent pending). B. Barrier base. C. Optimized lead spacing. All three offer maximum isolation and insulation of high-voltage leads for stratosphere operation.

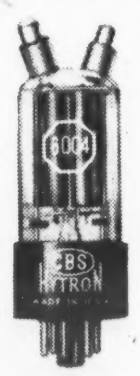
For ruggedization: D. Four-point mount support. E. "Mouse-trap" filament tensioner springs. F. Resilient superstructure cross springs. G. Low-pass mechanical filter between base and mount structure to absorb high-frequency components of shock. H. Cataphoretic-coated filament.



Is your aircraft equipment climbing up . . . up . . . up? Need an all-purpose rectifier — preferably ruggedized — to meet the challenge? High-altitude 5Y3WGTA . . . also the original ruggedized filamentary-type tube . . . is your answer.

At 50,000 feet* CBS-Hytron 5Y3WGTA offers you: Same maximum current and voltage ratings (with safe bulb temperatures) as the standard 5Y3GT at sea level. Plus JAN-1A ruggedization to withstand destructive shock, vibration, acceleration, and impact. And single-ended construction . . . convenient for both new and older equipment. (The 5Y3WGTA is interchangeable with the 5Y3GT or 5Y3WGT.) Check the 5Y3WGTA's ratings . . . its rock-solid construction.

90,000 FEET UP! New CBS-HYTRON 6004



Climbing higher still? Plate connections to top caps of 6004 push ceiling far into stratosphere. CBS-Hytron 6004 operates at 90,000 feet — higher at adjusted ratings — free from arc-over and at safe bulb temperatures. See comparative data for ratings.

COMPARATIVE DATA

Max. Ratings	5Y3WGTA	6004
Operating altitude	50,000 ft.*	90,000 ft.*
Peak inverse plate voltage	1,400 v†	1,000 v††
Peak plate current per plate	400 ma.	400 ma.
Bulb temperature	185° C	185° C
JAN-1A ruggedized	Yes	No
Basing	Single-ended	Double-ended

*Adjusted rating chart available for higher altitudes.† At 50,000 feet.†† At 90,000 feet

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A DIVISION OF COLUMBIA BROADCASTING SYSTEM, INC.

SALEM, MASSACHUSETTS

HYTRON RADIO & ELECTRONICS CO.
Salem, Massachusetts

Please send me full data (including adjusted rating chart for higher altitudes) on CBS-Hytron high-altitude rectifiers: 5Y3WGTA and 6004.

YOUR NAME.....
(please print)

COMPANY.....

STREET ADDRESS.....

CITY AND STATE.....

CHAPTER NEWS

In comparing the American way of life and standard of living to that of Japan, Dr. Van Zandt said he felt that our excellent communications system is a contributing factor to our higher living standards.

Memphis

Memphis, Tenn., joined the ranks of AFCA chapters in June. Organized through the efforts of Roy Freeman of the Southern Bell Tel. & Tel. Co., and Ralph Grist, AFCA Southeastern area representative, the chapter has a large potential civilian and military membership in its area. Plans are now being made to publicize the association and build up the chapter membership.

Temporary officers to serve during the organizational period have been chosen as follows: president—H. W. Slavick, Memphis Publishing Co.; 1st vice-president—W. S. Shetzley, Southern Bell Tel. & Tel.; 2nd vice-president—Irby H. Boyd, Boyd Electronic Supply; secretary—Walter E. Mewborn, Civil Aeronautics Administration; treasurer—Robert M. Coleman, Southern Bell.

New York

Brig. General Brooke E. Allen, USAF, commanding general of the Air Photographic and Charting Service of the Military Air Transport Service, was guest speaker at the chapter's May 28th meeting which was held jointly with the Atlantic Coast Section of the Society of Motion Picture and Television Engineers.

General Allen gave a most interesting and instructive talk on the photographic mission and organization within the Air Force, and explained the various responsibilities of the Air Photographic and Charting Service and the different means employed by them in connection with their assigned missions.

Adm. Walter S. Anderson, chapter vice president, presided in the absence of Chapter President Ted Bartlett who was out of town. There were 135 AFCA members and guests present.

Philadelphia

The chapter's annual dance was held June 20th at the officer's club of the Quartermaster Depot. As an incentive to end the year's membership drive in high gear, any new member who joined after June 1st and the chapter member who sponsored him each received a complimentary ticket to the dinner-dance.

(Report of the meeting and the election of new officers had not yet been received at headquarters as SIGNAL went to press.)

Pittsburgh

Col. William M. Talbot, Director of Warning & Communications, Federal Civil Defense Administration, was guest speaker at the chapter's May 15th meeting. (Report not yet received as SIGNAL went to press.)

Sacramento

Photography was the theme of the April 23rd dinner-meeting, with Howard Luray, district manager, Photolamp Division, Sylvania Electric Products, and author of several books on the development of photo flash lamps, as the principal speaker. Earlier in the day, Mr. Luray delivered the same lecture before a smaller group of members and guests in the photo lab of the Sacramento Signal Depot.

There were a number of other photography features during the course of the evening. Robert McCurry of the McCurry Foto Co. displayed many of the newest developments in photography, including Polaroid cameras and a new model sound motion picture projector. Major John Patterson, commanding officer of the Human Resources Research Unit stationed at Mather Air Force Base, demonstrated the important part played by photography in training Air Force observers. To further illustrate the important part now being played by photography in the training of Air Force personnel, a short picture was shown of a mock bombing run on the Golden Gate Bridge. DeWitt Bishop, president of the Sierra Camera Club, described the aims and objectives of his group and displayed many of the prize winning pictures taken by its members.

Some 160 members and guests attended the meeting in the post restaurant of the Sacramento Signal Depot and the social hour which preceded it.

A team of Signal Corps soldier specialists from the Signal Corps center in Fort Monmouth, N. J., visited the depot on April 29th and demonstrated some of the latest mobile Armed Forces communications equipment. Four one-hour demonstrations were given in order to give those persons interested a chance to view at first hand the new equipment recently developed by the Signal Corps Engineering Laboratories and now rolling off the production lines of the communications and electronic industries.

Special guests of the chapter were city, state and county officials and personnel from Mather and McClellan Air Force Bases. Approximately 1200 people witnessed the demonstrations during the course of the day.

A capacity crowd of 250 members and guests gathered in the post restaurant of the Sacramento Signal Depot on June 19th to honor Colonel Floyd T. Gillespie, depot commander. This was the chapter's last meeting for summer and was its farewell to Colonel Gillespie who will retire before the chapter meets again in the fall.

Featured speaker was Howard Van Zandt of Kellogg Switchboard and Supply Company who stopped over at Sacramento while en route to Spokane, Washington, to address the joint convention of the Oregon and Washington State Telephone Association.

Lloyd Dodds, Mountain States Telephone & Telegraph Co., Cheyenne spoke before the May 12th Cheyenne Chapter meeting.

A page from the note-book of Sylvania Research

X-ray diffraction aids the study of Sylvania phosphors

In the manufacture of radio tubes, Sylvania engineers employ X-rays as an important tool.

X-rays help determine when two or more metals or compounds have reacted to produce a homogenous mass, or some desired different solid phase such as that used for special coatings on radio tube components.

Strong X-rays from an X-ray tube also cause each chemical element present in a solid material to emit characteristic X-rays of their own. This phenomenon enables engineers to determine the actual elements present . . . and their amounts.

In Sylvania laboratories, X-ray diffraction is employed to study the fundamental properties of phosphors and semiconductors and their behavior under controlled alteration. It is also used to determine changes occurring during manufacturing processes.

This X-ray application is still another example of the research and up-to-the-minute techniques behind the quality production of Sylvania parts and products.

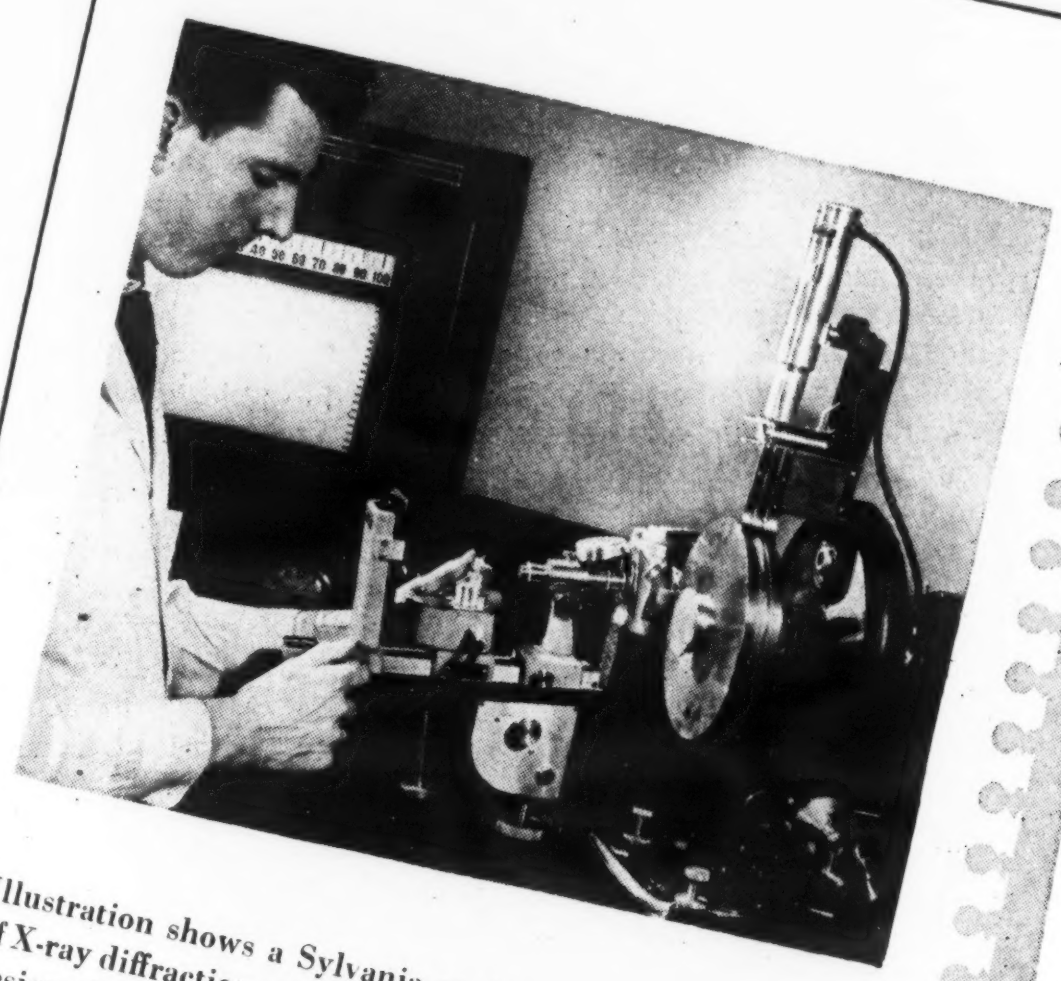

Illustration shows a Sylvania engineer studying the effect of X-ray diffraction on a semiconductor, using new Sylvania-designed equipment.

SYLVANIA

Sylvania Electric Products Inc., 1740 Broadway, New York 19, N. Y.

RADIO TUBES; TELEVISION PICTURE TUBES; ELECTRONIC PRODUCTS; ELECTRONIC TEST EQUIPMENT; FLUORESCENT TUBES, FIXTURES, SIGN TUBING, WIRING DEVICES; LIGHT BULBS; PHOTOLAMPS; TELEVISION SETS

Scene at May meeting of Scott-St. Louis Area chapter meeting. Howard Van Zandt, featured speaker of the evening is seated right of the microphone at the speakers table. Right: Clifford Wassall (standing) Defense Activities Engineer, Southwestern Bell Tel. Co., introducing his company's domonstration "Scientific Magic and Your Telephone" by Irving Mattick. The demonstration was featured in addition to a talk by Maj. General Raymond Maude at the April 11th meeting of the Scott-St. Louis Chapter. In foreground, Mortin Cummings of Bell.

Mr. Van Zandt pointed out that telephone companies and administrations in many Asiatic countries are seeking American technical advice and capital. However, he said lack of training in Asiatic languages is a serious handicap as it is of small value for an Occidental advisor to possess unsurpassed knowledge in his profession if he cannot pass this knowledge on to the natives he is directing. "The chief obstacle to hurdle during the Occupation was that of language," stated Van Zandt. "It was necessary to train six thousand Japanese operators to speak English well enough to handle the Occupation Forces telephone traffic. These operator-interpreters, as they might well be termed, are indispensable to the United Nations forces in Japan. Were it not for them, it would be impossible to utilize Japan's domestic telephone system without leasing toll and local facilities on a wholesale basis."

Stating that the Japanese have been handicapped for over 60 years due to a shortage of capital with which to expand the government-owned telephone system. Mr. Van Zandt felt that once the capital is raised the telephone service will improve rapidly since the Japanese are now receiving training in telecommunications colleges organized in the past three or four years on modern lines. These colleges offer 2 to 4 year courses and are provided with practical working models and an abundance of visual aids. "American communications experts who have inspected the Japanese schools have come away with a new and greater increased respect for the ability of the Japanese. They have learned lessons that they can pass on in the U.S." In this connection, Mr. Van Zandt stressed the need in the U.S. for courses in telephony at state schools, remarking that for many years the telephone industry has, to a considerable extent, depended upon graduates of the Army, Navy and Air Force signal schools to staff the technical positions.

He also emphasized the importance of Americans learning to understand the culture and background of the Japanese in order to achieve the mutual respect necessary to maintain goodwill and cooperation between the two peoples.

Special guest of the chapter was General "Pete" Shearer, former commanding officer of the Sacramento Signal Depot and original founder of the Sacramento Chapter.

San Francisco

A plant inspection tour of the Lenkurt Electric Company in San Carlos featured the chapter's May 15th meeting. The company manufactures telephone and telegraph carrier equipment and has over 120,000 square feet of floor space devoted to the production of carrier systems and component parts. Particular interest was shown by the members in the new point-to-point radio systems and in such manufacturing processes as toroidal coil winding, filter assembly, and powdered metal core production.

The members met for dinner at the Villa Chartier, San Mateo. Col. Lloyd Parsons, chapter president, expressed his appreciation for the excellent turnout and said that he had made a tour of the Lenkurt plant during the past week and was sure everyone would find the evening there well spent. Following dinner, the group proceeded to San Carlos, some three miles away, W. R. Patton, Lenkurt publications manager and vice-president of the chapter, who had made all arrangements for the tour, welcomed the members and briefed them on the various points of interest before they were conducted through the plant.

The San Francisco Chapter toured the Lenkurt Electric Company plant in San Carlos, California during their May meeting. Left: Capt. E. E. Berthold, Div. of Communications, Western Sea Frontier (others unidentified). Right: Lenkurt publications manager W. R. Patton addressed part of the group (right) and handled arrangements for the tour.

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Spotlights

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Refreshments were served in the company cafeteria at the conclusion of the tour.

Among the members and guests present was Captain E. E. Berthold, USN, Director of Communications, Western Sea Frontier, who had recently joined the chapter.

Scott-St. Louis

On May 9th, Scott-St. Louis was added to the ever-growing list of chapters addressed by Howard Van Zandt, whose lecture on "Adventures in Telecommunications in Japan" has become the most popular program feature available to AFCA chapters.

The chapter's publicity chairman, Howard D. Yund, reported the meeting as follows: "Van Zandt's talk proved not only extremely interesting but also inspirational. In the short time of an hour he brought a depth of appreciation for Oriental culture and the importance of our understanding Oriental People which might otherwise not have been realized by chapter members. He illustrated Japanese language characters on the blackboard and brought out several humorous things to be observed in studying the Japanese language. He clearly brought out the manner in which industrial efficiency is limited by telephone and telecommunications facilities in Japan, giving the background part played by Oriental customs and culture. He also emphasized the importance of technical people visiting foreign countries having an understanding and appreciative attitude toward them, pointing out that while we may excell in technical and industrial development they have many qualities in which they are superior. A poem by Rudyard Kipling climaxed Mr. Van Zandt's outstanding program."

The dinner-meeting was held at the Elks Club in Belleville, Ill., and was attended by 75 members and guests. Chapter Secretary Allen Eisenmayer presided in the absence of Col. William Snouffer, president.

A preview of the new Air Force training film "Radio Antenna Fundamentals" was shown at the June 5th meeting. Harold D. Thornhill, educational specialist in the department of advanced courses, 3310th Tech. Tng. Group at Scott AFB, who had been the technical advisor assigned to the project of producing the film, gave an interesting introduction. The film had been requested through channels by the training schools at Scott AFB about two years ago and had been completed just recently. It clearly demonstrated the capabilities of the photographic industry in producing clever and ingenious training aids and devices to improve instruction in technical subjects which normally are extremely difficult to illustrate.

Colonel Harold T. Gallagher, Kentucky Chapter President presents AFCA medal to Mrs. Mary Steffens, awarded in the membership drive. D. W. Freeman and Mrs. Emma May Frank look on. The award was made at the Lexington Depot.

Chapter President Bill Snouffer reported on his attendance at the national convention in April, and was assisted by H. D. Yund who illustrated some of the convention activities with slides made from photographs taken at the event.

A television set was furnished and installed for the evening by D. & S. Inc. of Belleville so that chapter members could watch the Walcott-Charles fight. As a surprise gesture, the program committee arranged to provide free beer and soda during the fight.

A committee consisting of W. W. Vau Skiver and George M. Depew was appointed to draft a constitution and set of by-laws for the chapter for submission to the board of directors and the entire membership. It was announced that identification badges would be used at all future meetings, and that during the inactive summer months the secretary would send an information questionnaire to each member for the purpose of preparing a membership directory.

Seattle

The annual "ladies' night" meeting was held on May 14th in the Chamber of Commerce Building. Chapter President Frank Keyser welcomed the ladies on behalf of the chapter and for their benefit briefly explained the purposes of the AFCA.

Following a brief business session, the meeting was turned over to James F. Johnson of the Signal Equipment Co., and amateur magician and sleight-of-hand performer, who staged a very entertaining program.

The Coast Guard barge at Pier 70, with Capt. F. K. Johnson, captain of the port as host, was the scene of the chapter's June 11th meeting. After welcoming the members, Captain Johnson described the Coast Guard organization and outlined its activities in the Seattle area.

Final plans were set for the chapter to inspect the Navy transmitter station at Jim Creek, Arlington, Snohomish County, on July 13th. The certificate of honorable mention awarded to the chapter during the 1951-52 chapter contest was displayed to the members and then turned over to the secretary for the files.

The program for the evening was provided by A. A. Baird, superintendent of Western Union in Seattle. He first described the Western Union push-button teletype switching systems installed for various agencies and companies and then presented a film showing the services and facilities offered for messages by facsimile, radio relay, etc.

South Carolina

The chapter met at the Navy Minecraft Base in Charleston on May 7th with a pre-meeting dinner held in the ballroom of the officers' club.

Capt. Henry McCarley, chapter president, appointed the following committee to select nominees for the board of directors: R. F. Farmer, chairman, L. J. Gunter and Harmon Seavers.

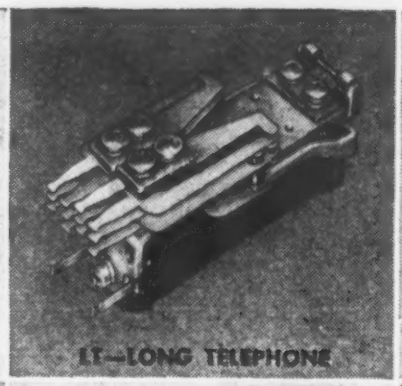
Due to the last minute cancellation of the guest speaker, the program time of the meeting was devoted to report on the national convention in Philadelphia by Chapter Secretary Carl Newman who had represented the chapter at the various conferences and events.

President McCarley once again stressed the importance of securing additional members, especially among the armed services, and asked each member to set as his personal goal at least one new member during the coming year.

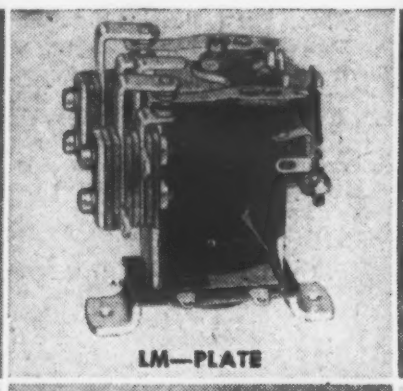
Neil F. Harmon, civil defense director of the electronics department of General Electric Company, spoke on "Civil Defense in the U. S." at the chapter's June 4th meeting. He cov-

MT—SMALL TELEPHONE

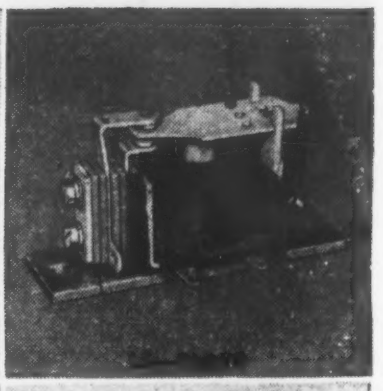
ST—SHORT TELEPHONE

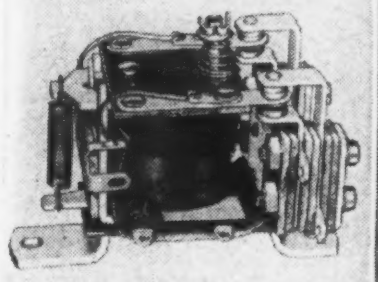


LT—LONG TELEPHONE

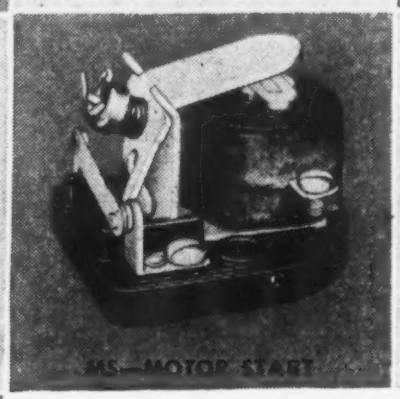


LM—PLATE

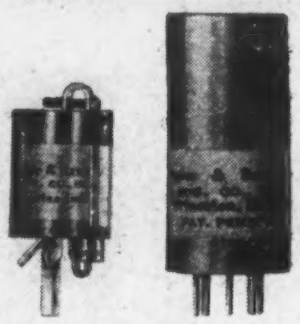




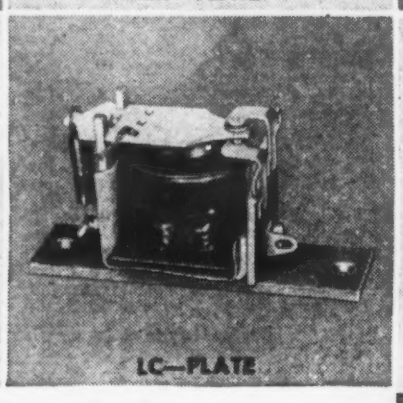
MR—MEDIUM POWER



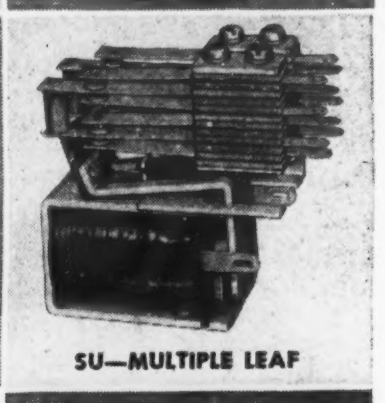
MS—MOTOR START



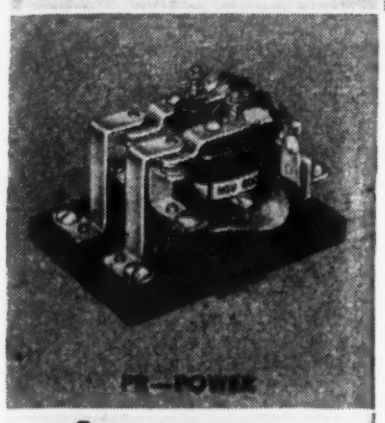
SM—SUPER MIDGET



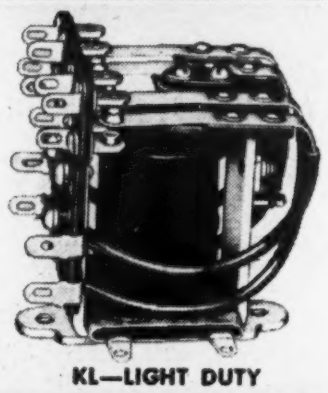
LC—PLATE



SU—MULTIPLE LEAF



PE—POWER

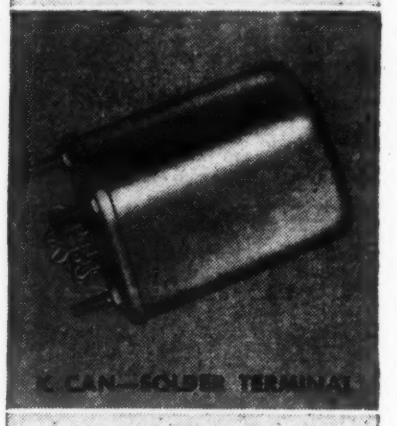


KL—LIGHT DUTY

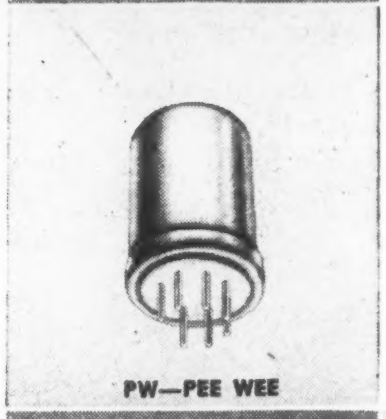
KR—LIGHT DUTY

P CAN—OCTAL PLUG

K CAN—OCTAL PLUG

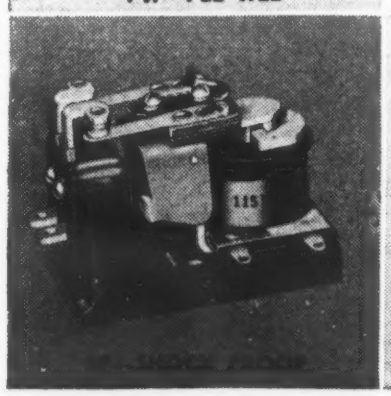


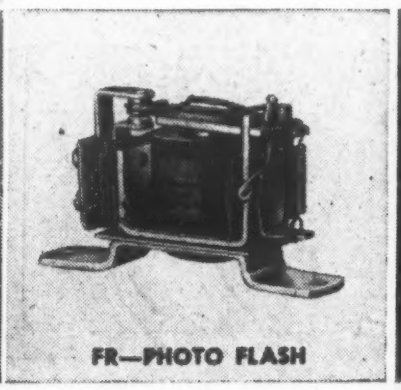
K CAN—SOLDER TERMINAL



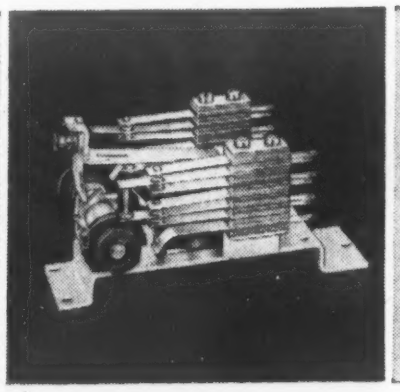
PW—PEE WEE

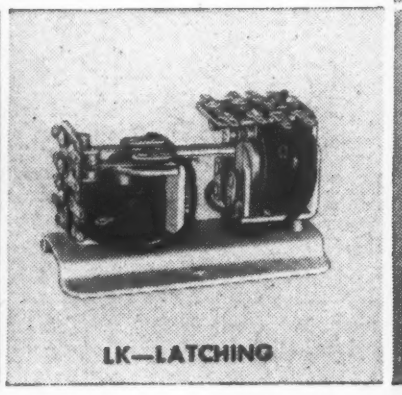
M CAN—14 PRONG PLUG



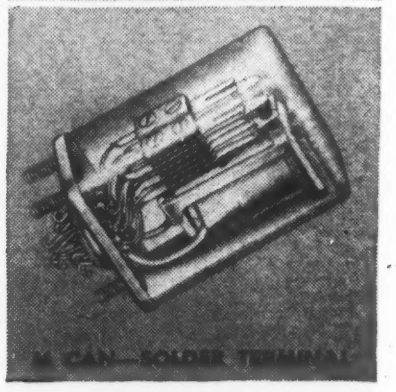


FR—PHOTO FLASH





LK—LATCHING



M CAN—SOLDER TERMINAL

ered the progress of this phase of the country's defense from the passage of the Civil Defense Law by Congress to the present day. Outlining the various functions of the different departments in the civil defense set-up, he suggested in broad terms a policy that could be followed by all communities. Mr. Harmon's talk was very interesting and informative and from comments heard after the meeting was enjoyed by all.

Held at the VFW Club in Columbia, the meeting was attended by 38 members and guests. Special guests of the chapter were Sloan Bradford, civil defense director for the city of Columbia, T. E. Maxwell, Columbia city manager, and Mayor Macfie Anderson of Columbia. Chapter Vice-President Charles M. Bell presided at the meeting since Capt. McCarley was in Washington.

F. E. Warren-Cheyenne

A lecture-demonstration on television by Lloyd Dodds of the Mountain States Telephone & Telegraph Co. featured the chapter's May 12th meeting.

Labelling his talk, "The Unveiling of Television," Mr. Dodds described television operation in the very beginning, went on to its transmission over coaxial cable, and finally to its transmission over the new TD-2 microwave radio relay system recently put into operation by the Bell Telephone System. The demonstration included actual transmission of a signal at microwave frequencies (10,000 megs.) and the effect on line of sight transmission of different articles which were interposed into the path.

The fifty-two members and guests were most enthusiastic about the evening's program.

Washington

On May 31st, a group of members from the Washington and Baltimore Chapters attended a demonstration staged by the Marine Corps Schools at Quantico, Va., at the invitation of Lt. Gen. C. B. Cates, commandant of the schools.

Scheduled as a feature of the Department of Defense civilian orientation program, the demonstration included the use of helicopters in an assault troop lift, the tactics and techniques of a reinforced Marine Corps rifle platoon in the amphibious assault of a fortified beach position, flame-throwing tanks, etc. The close air support techniques to be included in the demonstration were cancelled due to bad weather. A hot lunch was served to the audience in the field.

Rear Admiral Joseph R. Redman, USN(Ret.), Vice-President of Western Union Telegraph Co. and former Chief of Naval Communications, has been elected president of the Washington Chapter for 1952-53. Vice-presidents are: Maj. Gen. George I. Back, Maj. Gen. Raymond C. Maude, Rear Adm. W. B. Ammon, and J. R. B. Crigler; secretary-treasurer — James F. Coll; general counsel—J. E. Pernice; member executive committee—Percy G. Black, outgoing president.

The new Board of Directors consists of: Capt. W. H. Beltz, USN; Capt. H. E. Bernstein, USN; T. E. Berrier; Francis Colt deWolf; Francis H. Engel; Brig. Gen. I. L. Farman, USAF; Capt. F. R. Furth, USN; Brig. Gen. B. E. Garland, USAF; E. J. Girard; George T. Harris; Capt. R. R. Hay, USN; Rear Adm. C. F. Horne, USN(Ret.); Glen McDaniel; W. J. McManus; Rear Adm. John R. Redman, USN; Maj. Gen. W. O. Reeder, USA; Capt. Earl K. Rhodes, USCG; Col. C. S. Stodter, USA; Col. W. M. Talbot, USA(Ret.).

New York University

The following officers have been elected to head the NYU student chapter during 1952-53: Roger Berry, president; Albert W. Charmatz, vice-president; Edward Abelowitz, secretary.

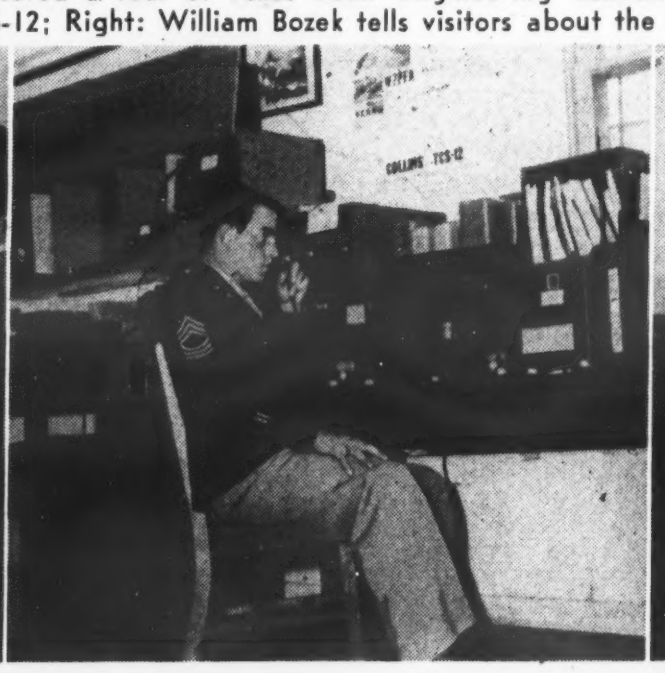
J. C. Longstreth, Vice President and General Manager Bell Telephone Co. of Pennsylvania addressed a recent meeting of the Pittsburgh Chapter.

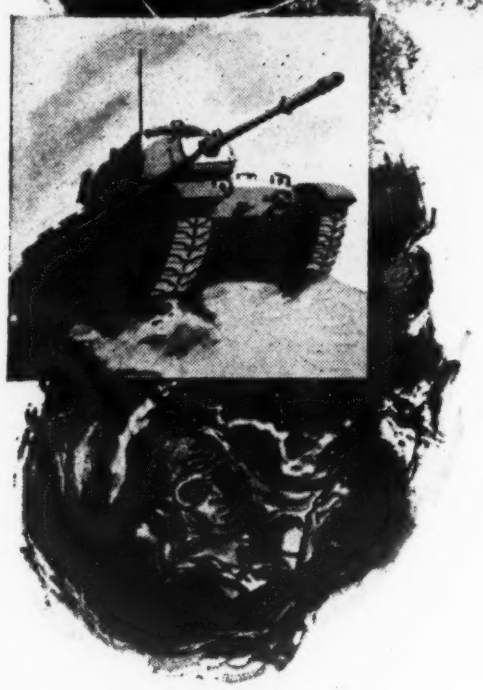
Texas Tech

The new officers of the Texas Tech student chapter are: Charles I. Powell, president; Foster Cook, 1st vice-president; Charles Maple, 2nd vice-president; Don Mears, secretary; Don Whigham, treasurer. Major Victor Penuel, SigC Asst. PMS&T is chapter sponsor.

The Texas Technological College engineering show was held April 18th and 19th, with the AFCA student chapter sponsoring the Signal Corps part of the show. Some 10,000 people attended the exhibits.

Texas Tech April Meeting—Signal Corps sponsored a tour of Texas Tech engineering school. Center: Walter Massengale demonstrates Collins TCS-12; Right: William Bozek tells visitors about the AN/PGC.





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The rich experience and vast facilities of Delco Radio are again at the service of the nation!

Delco Radio has a major part in the current rearmament program . . . is currently producing advance-type radio equipment for many branches of the military. Delco Radio products serve equally well in civilian communications . . . in millions of passenger cars and trucks . . . in untold numbers of homes. Yes, in peace as in war, Delco Radio is on the front line in communications with on-time production of *superior* products. See for yourself!

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LEADER...

IN PRODUCTION

Delco Radio is the world's largest builder of automobile radios . . . the leader in production and assembly of component parts.

LEADER...

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Delco Radio developed many of the most important advances in automotive radio . . . has unsurpassed experience in this field.

LEADER...

IN QUALITY

Every step in the manufacture of Delco Radio products is closely supervised to maintain high, uniform product quality.

LEADER...

IN MANUFACTURING

Completely integrated for efficient production, from raw material to finished product, Delco Radio meets any customer need.

Convention Postscript

Credit for the outstanding success of the AFCA Sixth Annual Convention in Philadelphia last April should be given to the members of the local Convention Committee. We did not have room to include their names with the Convention Story in the May-June issue of SIGNAL, but are happy to do so now . . .

Rr. Adm. Rico Botta, Commander, Naval Air Material Center; Mr. Walter J. Cannon, Diamond State Telephone Co.; Mrs. Victor K. Cohen, Victor-Bernard Industries, Inc.; Brig. Gen. W. Preston Corderman, C.O., Sig. Corps Procurement Agency; Mr. Russell E. Cramer, Jr., Radio Condenser Co.; Mr. Carl R. Freehafer, Diamond State Telephone Co.; Mr. Wilfred D. Gillen, Bell Telephone Co. of Penna.; Mr. A. S. Hawthorn, RCA Victor Division; Captain H. A. Ingram; Col. J. Harry LaBrum—Attorney; Lt. Cmdr. Winifred Love, Air Materiel Center; Lt. Cmdr. Leslie Mohn, USN, Hqs. 4th Naval District; Major Wm. F. Powell, Jr., Bell Telephone Co.; Lt. Col. D. L. Rundquist, Regional Office, USAF; Mr. James Scurlock, Bell Telephone Co. of Penna.; and Col Robert G. Swift, AUS (Ret.), Bell Telephone Co. of Penna.

Many good pictures were taken at the Convention but space limitations prevented use of all of them in the last issue. Here are a few we believe you will enjoy.

Colonel Frank Kidwell, Maj. General H. Ingles, Brig. General James D. O'Connell and General Corderman at Signal Corps Procurement and Distribution Center.

Brig. General K. B. Lawton greets Bell Telephone of Pennsylvania girls, members of the reception committee at the convention.

Lt. Col. Klein, Lt. Col. Weikman, Philadelphia Regional Office of USAF welcoming John Markey, Boston, F. A. Hayden, Valpariso, Ind., George T. Cook, Philadelphia.

Seated at the table L-R: Col. Meyer Fried, Col. Wm. Snouffer, Maj. Richard Deane, AFCA Chapters Secretary, Julia Godfrey, Capt. Thomas Cline, Col. John McDavid. Standing: W. H. Propst, L. R. Yoh, P. B. Reed, E. A. Helderbrand.

Harry Ehle; William J. Halligan; Ass't Secty. of the Navy for Air, J. R. Floberg; J. Harry LaBrum; Captain J. Thatch.

Lee Gleezen, New York Bell Laboratories, is served by a smiling chef.

NEWS

Communications-Electronics-Photography

NPA's Special Order For Communications Industry

Further relaxation of the government's controlled materials plan, by the action taken under which ceilings have been raised on the self-authorization allowances for copper and aluminum, will afford definite aid to the communications industry in obtaining quantities of these controlled materials, officials of the National Production Authority's Communications Equipment Division pointed out Friday, June 20.

As a result of the general relaxation announced by DPA-NPA Administrator Henry H. Fowler, officials of the Communications Equipment Division, claimant agency for the industry, said they are studying what further relaxation can or should be made in the industry's special order, M-77. Under this order, considerable relaxation in self-certification procedures has already been made, with the increasing of the amount to be spent for any one project from $15,000 to $25,000.

At the same time, it was announced that more "tickets" are being made available to the communications industry to secure quantities of copper for the third quarter of this year. How much more copper will be made available to the industry has not yet been finally determined, but with the easing of the copper situation as indicated by Mr. Fowler's announcement the industry can look forward to a sizeable amount to cut into its backlog of service requests.

Good News For Wire And Cable Mills

This news will be particularly welcomed by the wire and cable manufacturers who have been unable to fulfill the demands of the industry for materials to carry out development programs highly essential to the defense program and defense-supporting activities.

However, it was announced that the DPA has again deferred finalizing its fourth quarter program of allocating steel, copper, and aluminum because of the continuance of the steel work stoppage which makes future supplies of this key metal uncertain. As pointed out by NPA officials earlier, the longer the steel strike continues, the greater proportionate reductions of fourth quarter grants.

The NPA action on self-certification regulations for copper and aluminum was the most sweeping taken by the agency since the controlled materials plan went into effect in July, 1951. Among other things provided by the order, in the form of three amendments to NPA regulations, are:

A manufacturer who has received allotments for the third quarter of any of the controlled materials in the amounts less than the new limit for self-certification may increase to the new limit for the third quarter without reapplying to NPA; and, a manufacturer may increase his self-certification for aluminum and copper by using his adjusted base period to calculate the quantity to which he is entitled to self-certify.

Briefly, these increases in self-certification limits are: Manufacturers of "B" (general use) products who previously could self-authorize 500 pounds of copper quarterly may now authorize up to 10,000 pounds, and for aluminum the amount is raised from 1000 to 20,000 pounds; those with a 3000-pound limit on copper, provided they do not exceed their base period use, can go to 20,000 pounds, and for aluminum they are raised from 4000 to 40,000 pounds. In addition, self-authorization by B product manufacturers during the third and succeeding quarters is permitted to the extent of 40,000 pounds of copper controlled materials and 60,000 pounds of aluminum, if the purchase requirements do not exceed 75% of base period use.

Mobilization agency officials did caution that, in the same swift manner that the materials orders were relaxed, they may again be tightened if domestic or international conditions warrant. A strike in the copper industry in this country, or a new flare-up overseas in the "cold war" would necessitate an immediate revision of NPA orders to channel the controlled materials into the most essential programs.

The relaxing of self-certification limits followed within 24 hours an announcement by Mr. Fowler of increased allotments of copper and copper base alloys totaling an estimated 16,000 tons monthly so as to make possible foreign purchases up to the limit of the International Materials Conference allotments for this country.

Incentive For Manufacturers To Buy Foreign Copper

Mr. Fowler said this incentive to manufacturers to buy foreign copper can now be given because the recent decline in world copper prices made it possible to revise the government's price policy so as to permit United States producers to pass on to consumers 80% of the differential between the foreign and domestic price of copper.

In another copper order late last week, NPA revised the raw materials distribution of the metal to insure an equitable division of both domestic and foreign refined copper. The new method will provide a separate monthly allocation of domestic refined copper to brass and wire mills, foundries and others, and authorizations will specify the quantity of allocated domestic refined copper. and the amount of foreign copper to which the producer will have an entitlement.

Earlier last week, Mr. Fowler announced an emergency action aimed at maintaining, as long as possible, an uninterrupted flow of components and sub-assemblies containing steel to vital defense programs during the period of the work stoppage in the steel industry. The NPA is giving specialized preferential status to certain authorized controlled materials orders in the high-priority categories.

Included in group getting preferential delivery and acceptance status for DO rated orders for component materials placed in support of specified military, atomic energy, and machine tool programs are the electronics and communications equipment programs of the Department of Defense and the Atomic Energy Commission.

International Telephotograph Channel Interconnection

Interconnection of the domestic telephone network of the Bell System with overseas radio telephotograph channels of other companies

THIS DEPARTMENT'S PRINCIPAL SOURCE

Telecommunications Reports

Roland C. Davies, Editor
National Press Building
Washington, D. C.

VULCAN NEEDED AN ANVIL...

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Philco Microwave equipment is designed for utmost reliability, flexibility and ease of maintenance... qualities demanded without compromise by the Armed Forces. Philco's ability to surpass these rigid standards provided the Armed Forces with an immediate source of vital communications equipment.

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is provided in a tariff filed by the American Telephone & Telegraph Co. with the FCC, to become effective July 7. Heretofore, interconnection of Bell System facilities with international channels of others has been permissible only for broadcast program service.

Press Wireless has filed a tariff for the private line channel telephotograph service, to become effective a few days after the A. T. & T. filing. It is expected that the principal customers for the telephotograph service will be the press associations. The first interconnections under the new tariff will be with Press Wireless.

The Bell System provides telephotograph service, under which specially-equipped telephone stations may send and receive photographs over regular telephone facilities, in its domestic system, principally for law enforcement, military, and press users. Originally, the service was limited to law enforcement officers, but it has been broadened to cover a few other groups.

Creecy—New Chief, Talbot to Stay

C. E. Creecy, who retired last April 1 from the Bell System after 40 years service with the Chesapeake & Potomac Telephone Cos. in transmission engineering, was appointed June 19 as Acting Chief of the Wire Communications Section of the Federal Civil Defense Administration's Warning and Communications Division, to succeed P. M. Schuchart, who resigned recently to become Director of Utilities of the Florida Railroad and Public Utilities Commission.

The appointment of Mr. Creecy, who was promoted to his new post from that of Civil Defense Communications Officer for FCDA Region 2, embracing North Carolina, Virginia, West Virginia, District of Columbia, Maryland, Pennsylvania and Delaware, was announced to TELECOMMUNICATIONS by Col. W. M. Talbot, (USAF ret.), FCDA Warnings and Communications Division Director.

It was also learned that Colonel Talbot is remaining in his post with FCDA and has decided not to become associated with a Pacific Coast radio-electronic manufacturing company as its president, a post which had been offered him. After the offer by the West Coast company, it was understood that the FCDA leadership strongly urged Colonel Talbot to continue in the direction of the civil defense communications and warnings program.

Mr. Creecy has not only a lengthy record of service in telephone engineering and transmission and plant operations, but also during World War II actively worked with Colonel Talbot when the latter was commanding officer of the Eastern Coast Aircraft Warning Service. Mr. Creecy, at that time, established all the information and filter centers in Virginia and did the technical planning and over-all supervision of the radar stations and the telephone and communications facilities in the air defense centers and the air bases in that state.

Mr. Creecy started in 1912 with the C. & P. group headquarters, then located in Baltimore, in general engineering, after he had attended Massachusetts Institute of Technology for more than three years. He next was assigned to the group headquarters when it was moved to Washington, and practically from the start of his career was placed in charge of transmission engineering.

In 1929, he was transferred to C. &. P. of Virginia, where he was appointed transmission and outside plant engineer, serving in that capacity until his retirement last April 1. He joined the FCDA as Region 2 communications officer after he retired. During World War I, he served in the Army Signal Corps as a captain in France for two years.

AF Personnel Change

Colonel George H. Sparhawk, former Chief of the Electronics Systems Division, Headquarters Director of Communications to Exercise "PINETREE" at Ottawa, Canada.

Colonel Harry French, former Vice Commander of the 30th Air Division (Defense) to Chief of the Electronics Division in the Directorate of Communications, Hdq. USAF.

Colonel Gomer Lewis from the Plans Division, Headquarters Director of Communications to the Engineering Division, Headquarters AACS. Andrews AFB, Maryland.

Colonel Paul Long, from command of the 1060th Communications Group, Washington, D. C. to the 5th Air Division, Rabat, North Africa.

Colonel Charles "Chick" Gordon from Communications-Electronics Chief for the Continental Air Command to Chief of the Communications Systems Division, Director of Communications, Hq. USAF.

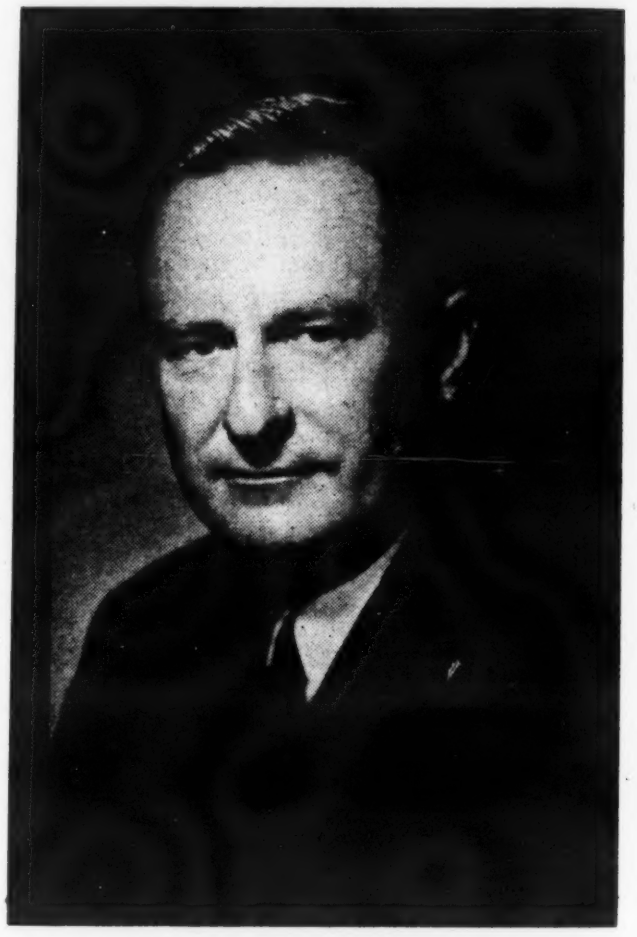
Colonel Gordon Wildes, from Chief, Communications Division, Hq. USAF, to Operations Deputy for the U.S. Air Force Security Service, Brooks Air Force Base, Texas.

Colonel Edward Houghton, from the Plans Division, Directorate of Communications to Security Deputy for the U. S. Air Force Security Service, Brooks AFB, Texas.

Representatives of Communications-Electronics Industry Tour Belvoir

President Harold H. Buttner of the Federal Telecommunications Laboratories was one of about a dozen representatives of the communications-electronics industry who attended an all-day tour June 18 by the National Security Industrial Association of Fort Belvoir, Va., to observe the latest developments and equipment of the Army Engineer Corps.

Deceased



Walter Evans
President, Westinghouse Radio Stations.

Walter Evans, 53, president of Westinghouse Radio Stations, Inc., and vice president of Westinghouse Electric Corporation, died at Johns Hopkins Hospital, Baltimore, Md., Wednesday, May 28th.

A native of Columbus, Ohio, Walter Evans received his early education in Chicago and studied electrical engineering at the University of Illinois, where his courses were interrupted for service with the U. S. Navy during World War I. His boyhood interest in radio—he was a ship's operator aboard Great Lakes steamers at the age of 16—brought

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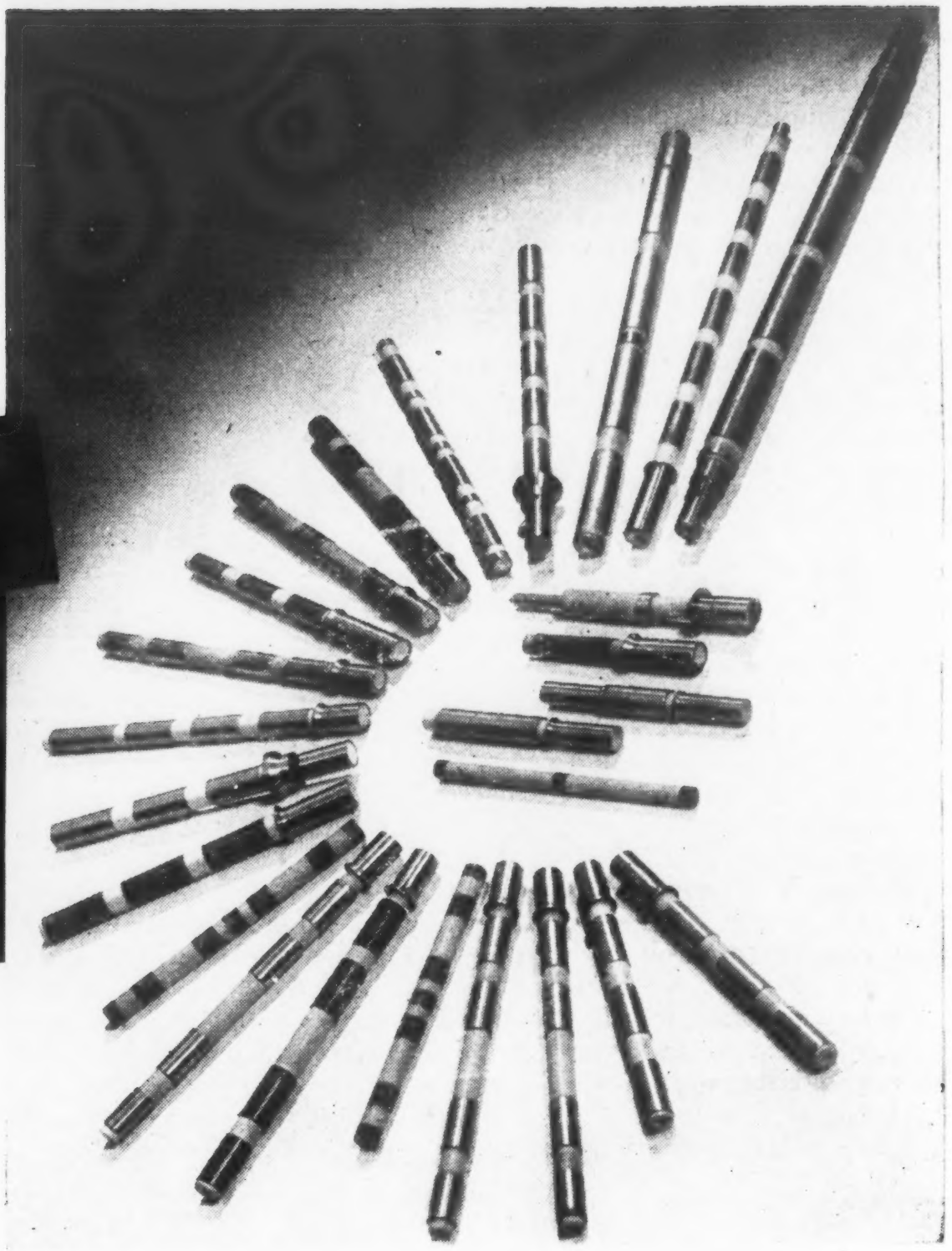

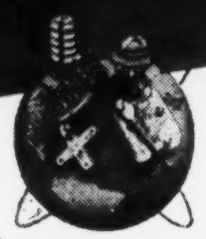

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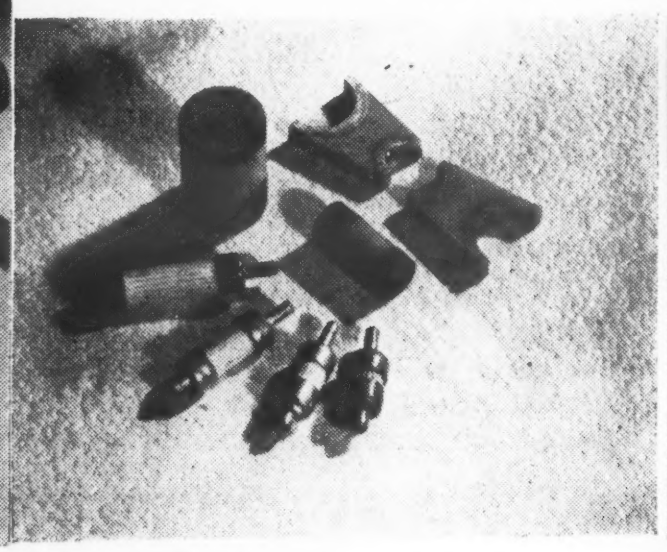
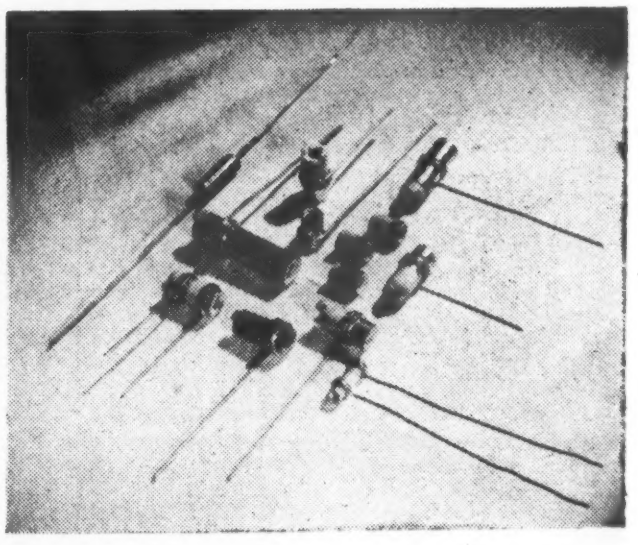
Stupakoff high-precision ceramic assemblies offer many opportunities to reduce costs, increase production and improve electrical and electronic equipment.

We will be glad to discuss your requirements with you and to submit samples for your inspection.





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assignment as an instructor at the Naval Radio School at Harvard and later he served as a radio operator aboard a sub chaser.

He completed his formal education after the war at the University of Illinois, where he was an undergraduate instructor in radio engineering, and at the University of Chicago.

Prior to joining Westinghouse as a radio operator at the then-new station KYW in Chicago in 1921, he served as wireless operator for the Marconi Co., RCA, and the United Fruit Company. While with the latter organization he supervised the first radio telephone installation on an American merchant ship.

Mr. Evans was appointed chief engineer at KYW in 1922, became general manager of that station four years later and in 1932 was placed in complete charge of all Westinghouse stations.

His duties were expanded the following year to include all of the radio manufacturing activities of the company as well as broadcasting, with responsibility for the development, manufacture and sales of radio broadcasting and communication equipment.

In 1936 Mr. Evans was elected a director of Westinghouse Radio Stations, Inc.; in 1939 vice president; and in 1947, president of that subsidiary.

In April, 1942, he was elected vice president of the Westinghouse Electric Corporation in charge of the X-Ray and Electronics Divisions in Baltimore, Md. In this capacity he increased production 120 times in manufacturing more than $400,000,000 worth of radar and allied electronic equipment for the military.

For "his contributions in connection with the development and production of radio and radar equipment during World War II" he was awarded Certificates of Appreciation from both the Army and the Navy.

In 1945 he organized the Westinghouse Television and Radio Division and directed its activities during its formative years. In 1950 he assumed supervision of the organization of the Air-Arm Division at Baltimore.

He relinquished his duties in connection with the three Baltimore Divisions on April 1 of this year because of ill health, but retained his association with Westinghouse Radio

NOW

emperature Compensating as well as By-Pass

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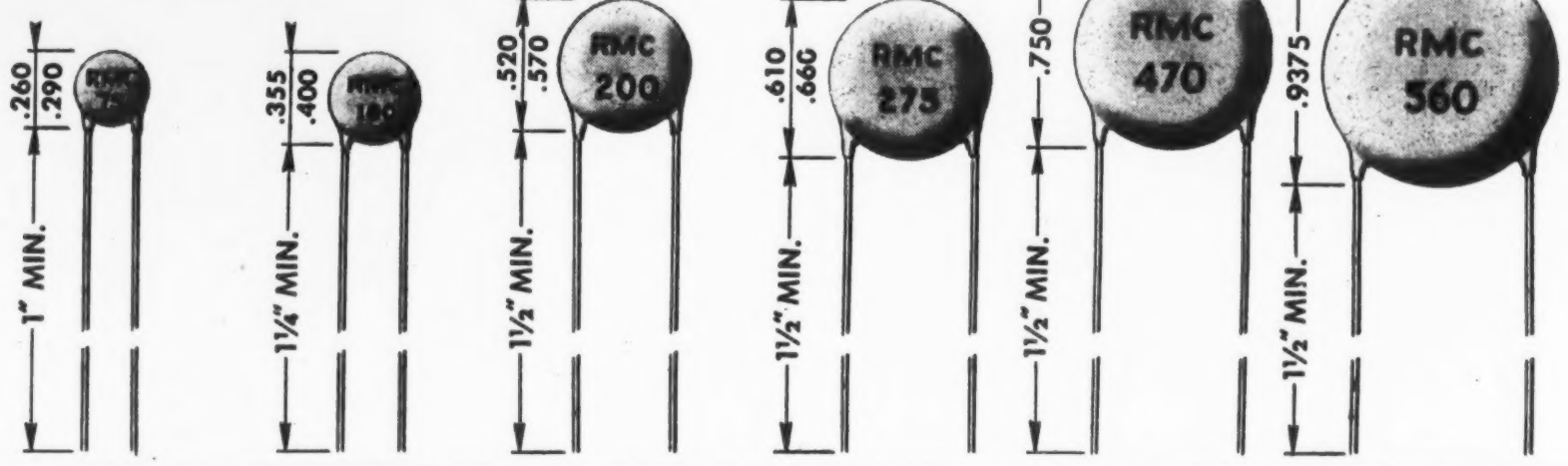
are Rated at 1000 Working Volts!



TC	1/4 Dia.	5/16 Dia.	1/2 Dia.	5/8 Dia.	3/4 Dia.	7/8 Dia.
P-100	—	2- 9 MMF	10- 30 MMF	—	—	—
NPO	2- 12 MMF	13- 27	28- 60	61- 75 MMF	76-110 MMF	111-150 MMF
N- 33	2- 15	16- 27	28- 60	61- 75	76-110	111-150
N- 80	2- 15	16- 27	28- 60	61- 75	76-110	111-150
N- 150	2- 15	16- 30	31- 60	61- 75	76-110	111-150
N- 220	2- 15	16- 30	31- 75	76-100	101-140	141-190
N- 330	2- 15	16- 30	31- 75	76-100	101-140	141-190
N- 470	2- 20	21- 40	41- 80	80-120	121-170	171-240
N- 750	5- 25	26- 50	51-150	151-200	201-290	291-350
N-1400	15- 50	51-100	101-200	200-250	251-470	480-560
N-2200	47- 75	76-100	101-200	201-275	276-470	471-560

If the samples you need are not here — send for them.

SPECIFICATIONS

POWER FACTOR: LESS THAN .1% AT 1 MEGACYCLE

WORKING VOLTAGE: 1000 VDC TEST VOLTAGE: 2000 VDC

DIELECTRIC CONSTANT: P-100 14K N-750 88K N-2200 265K NPO 35K N1400 165K

CODING: CAPACITY, TOLERANCE AND TC STAMPED ON DISC

INSULATION: DUREZ PHENOLIC—VACUUM WAXED

LEAKAGE RESISTANCE: INITIAL 7500 MEG OHMS AFTER HUMIDITY 1000 MEG OHMS

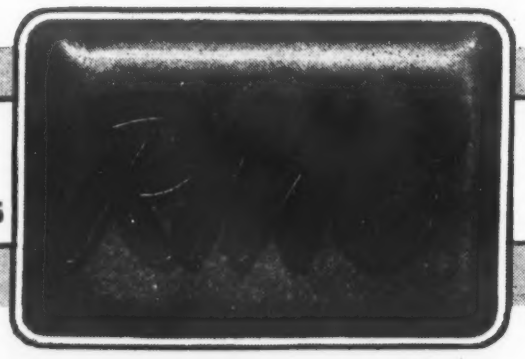
LEADS: #22 TINNED COPPER (.026 DIA.)

LEAD LENGTH: ¼" BODY 1", 5/16" BODY 1¼", ½" AND LARGER BODY 1½"

TOLERANCES: ±5%, ±10%, ±20%

RMC DISCAPS are Designed to Replace Tubular Ceramic and Mica Condensers at LOWER COST

SEND FOR SAMPLES AND TECHNICAL DATA



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Two RMC Plants Devoted Exclusively to Ceramic Condensers

Stations.

In 1941 Mr. Evans was named chairman of the International Broadcasting Committee of the Defense Communication Board. Previously he had taken a leave of absence from Westinghouse at government request to serve as industry technical adviser to the State Department at the International Telecommunication Conference at Madrid in 1932, and at Cairo in 1938.

A director of the Armed Forces Communications Association and former president of the Baltimore Chapter, Mr. Evans was a Fellow of the Institute of Radio Engineers, a director of Broadcast Music, Inc., a director of the Radio Manufacturers' Association and a member of: The Army Ordnance Association; the American Society of Naval Engineers; the Chi Psi Fraternity; and Tau Beta Pi, honorary engineering fraternity.

U. S. Civil Service Examination

The United States Civil Service Commission wishes to bring to your attention the Radio Engineer examination which they have just announced. The positions to be filled pay $3,410 and $4,205 a year and are in the Federal Communications Commission located in Washington, D. C., and throughout the United States, its Territories and Possessions.

To qualify, applicants must have had appropriate college study or progressive experience, or both. The age limits for positions paying $3,410 are 18 to 35; for positions paying $4,205, 18 to 62. Age limits are waived for persons entitled to veteran preference. Applications will be accepted from senior and graduate students who expect to complete all required courses within 6 months. No written test is required.

New Military Packaging Service Offered by Cargo Packers

Cargo Packers Incorporated of 73 Rutledge Street, Brooklyn, New York offers a specialized service for the packaging for shipment of electronic equipment.

In producing the very finest packaging and packing for the electronic industry, Cargo Packers has created containers to hold and protect everything from tiny ceramicons to 25 kilowatt transmitters. Many of its packaging developments have called for the use of new materials and techniques. Cargo Packers engineers have solved the difficult problem of providing perfect packaging for facsimile transceivers, transmitting tubes, magnetrons, thyratrons and complex equipment. Many of these involved complex problems of design and, in some cases, entirely new types of containers were designed.

Cargo Packers can provide absolute protection for delicate, precision and highly fragile products. It can protect them from breakage, fungus, rust, vibration, immersion and damage from harmful vapors.

By developing new techniques in packaging, Cargo Packers has not only immeasurably increased the safety factor in transportation but has also materially reduced the bulk of the package, packing time and overall packaging costs.

Westinghouse News

Joseph S. Parry, Jr., has been appointed assistant manager of Westinghouse Electric Corporation's Apparatus Division, it was announced recently by Tomlinson Fort, vice-president and Division manager.

Prior to his present promotion, Mr. Parry was industrial manager of the Company's eastern district, New York City office. His new offices will be at East Pittsburgh, Pa.

Mr. Parry joined Westinghouse as a member of the Graduate Student Training Course in 1920 following his graduation from Princeton University. Since 1922 he has held various sales positions in the Eastern District where his duties were primarily concerned with the Company's industrial customers. He is a native of Westfield, New Jersey.

* * *

Two million dollars worth of radio transmitters for delivery in July are being built for the United States Air Force by Westinghouse Electric Corporation at its Los Angeles manufacturing and repair plant.

"The transmitters will become part of a world-wide communications network for ground-to-air and ground-to-ground contact with any Air Force base in the world," said Frank R. Robb, manager of the Westinghouse plant.

The transmitters, built to send signals up to 7,000 miles, have a high frequency range of from 2,000 to 30,000 kilocycles.

Telegraph code signals of 500 words a minute can be transmitted on their radiotelegraph channels while "wings" for voice communication are provided on their radiotelephone modulators. For radiotelegraphy, the transmitters are equipped for sending either by telegraph key or by teletype.

Alexander Simon—50 Year Western Union—Retires

Completing 50 years of service in the telegraph industry in New York City, Alexander Simon, general manager, Metropolitan Division of the Western Union Telegraph Company will retire July 1. As the result of his direct contacts with the telegraphing public and his active participation in civic affairs, he is one of the best known executives in the city.

Mr. Simon started work in 1902 as a Western Union messenger in New York City, and successively became clerk, operator, manager and commercial representative. He was manager of Western Union's main cable office at 40 Broad Street from 1911 to 1916, handling many World War I cablegrams of military and diplomatic importance.

For five years Mr. Simon was district superintendent of the area from 42nd Street north to the city line. He then served as sales manager and acting general manager of the Metropolitan Division.

As general manager for the past 14 years, he supervised all commercial telegraph operations in Greater New York, Long Island and Jersey City, Bayonne, Hoboken and Union City.

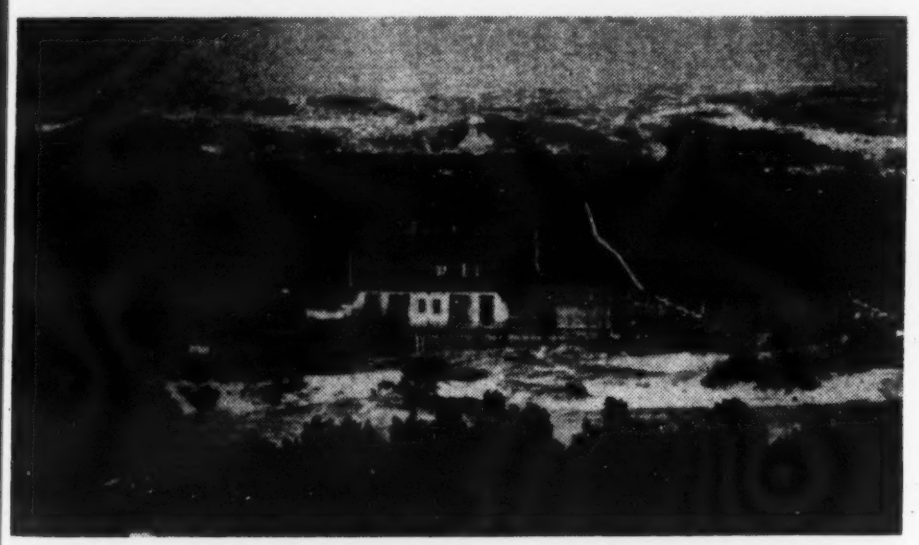
NEW Wollensak Mirrotel Lenses with Amazing Mirror Optics

Long Focus Lenses for Special Military Requirements

Actual tests show that light transmission and resolving power obtained with Wollensak *Mirror Optics* and suitable films surpass anything so far achieved with telephoto lenses of the usual design. And since Mirror Optical system absorbs less light . . . is more efficient . . . lenses are lighter, shorter, more compact than conventional lenses.

ACTUAL MIRROTEL PHOTOGRAPHS

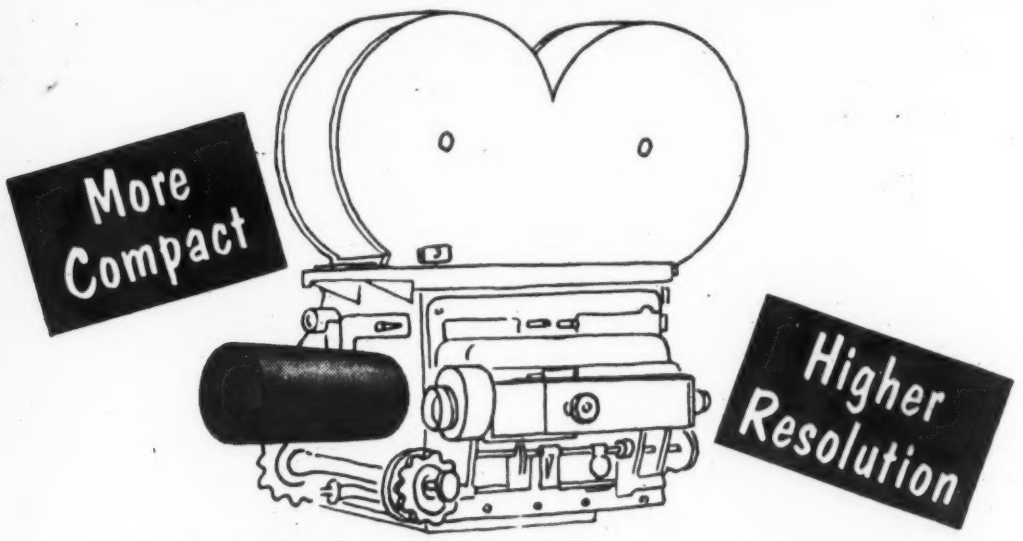
View of house from distance of one mile with normal focus lens



Same house photographed from same point with 18" Wollensak Mirrotel Lens

Same house photographed one mile away with 80" Wollensak Mirrotel Lens

18" f/5.6 MIRROTEL—A telephoto lens for use on 35mm still cameras. An excellent lens for special military purposes, press photographers, nature lovers, architects, police, construction engineers . . . in the theatre or at sporting events. It's a lightweight, compact lens. Easy to use. Delivers excellent definition. Perfect chromatic purity and freedom from any trace of coma or astigmatism.



40" f/8 MIRROTEL, 80" f/14 MIRROTEL—Special purpose telephoto lenses for use on 35mm motion picture cameras make excellent closeups of very distant objects. Five-time enlargement of 80" Mirrotel negative (even infrared exposures) gives as much detail as a direct exposure made with a camera of at least 400" focal length and 5 x 7 image size.

WRITE for more detailed information on Wollensak wonder, Mirrotel Lenses.

Higher Contrast

Wollensak

OPTICAL COMPANY, ROCHESTER 21, N.Y.

Radio Military Amateurs

Volunteer radio operators at NSS on Armed Forces Day, May 17th. Front to back: Lt. H. E. Thornhill, USN (W4DDT) on duty in the Naval Communications Division, Office of the Chief of Naval Operations; Commander D. J. Veazey, USN (W4ABY) on duty in the Electronics Division, Office of the Chief of Naval Operations; C. E. Van Pelt, radioman, first class, USNR (W4IRI), a civilian employee in the Office of the Chief Signal Officer, U.S. Army.

Armed Forces Day Radio Activities

One hundred and eighty-eight operators have received certificates of merit signed by the Honorable Robert A. Lovett, Secretary of Defense, in recognition of making perfect copy of his Armed Forces Day message to radio amateurs. The following message was transmitted at 25 w.p.m. by military stations AIR, NPG, NSS, and WAR.

Message from Secretary of Defense

It gives me pleasure to extend armed forces day greetings to the radio amateurs of America. This is an occasion upon which each of us should review his position and responsibilities in the overall program for national defense. Radio amateurs have a long and outstanding record of accomplishment and service in the fields of communications and electronics. Many of you are in active military service. Your self training and experience as radio amateurs are paying dividends to the nation. It is also recognized of course that your record of service is not limited to the military. The potential of amateur radio facilities for civil defense communications places a new and great responsibility upon you. I am confident that you will meet this responsibility with your traditional skill and initiative. The Department of Defense wishes you success in your endeavors and will continue to support and encourage amateur radio activities. (Signed) *Robert A. Lovett.*

Another feature of Armed Forces Day was the Military-to-Amateur radio test. Operating on preannounced military frequencies, AIR, NSS, and WAR made test contacts with radio amateurs. A total of 993 contacts was made during this test. Special Armed Forces Day acknowledgement (QSL) cards have been sent to all amateurs who participated.

U. S. Naval Academy Amateur Radio Club

Few extracurricular activities at the Naval Academy have such direct application to professional life as amateur radio. A study of the list of former members of the Naval Academy Amateur Radio Club shows that many continue to be active in the communications-electronics field after graduation. For example, about 50% of the surviving club members from the class of 1931 are so engaged.

The charter membership of the club included two first-classmen, class of 1929. The class of 1953 has twenty-eight members.

Equipment has increased along with the membership. The club's amateur radio station, W3ADO, was originally equipped with one 50-watt transmitter for CW operation on two amateur bands. Now there are four transmitters, ranging in power from 75 to 800 watts. Two other transmitters are being constructed. When these are completed, W3ADO will be able to cover all amateur frequencies from 3.5 to 148 mc. In addition to CW operation, all types of phone operation, including single sideband, are available.

Activities of the club include membership in the American Radio Relay League and Army MARS. The officer representative is CAPT R. W. W. Booth, U.S. Air Force.

Distress and Rescue Work

The Military Amateur Radio Service's Air Force segment was busy this spring handling distress and rescue work in the Omaha area. The flood disaster work, an annual function of the Air Force amateurs saw radio teletype units, as well as point to point service, come into play as the MARS circuits hummed with necessary relief traffic. Brigadier General Ivan L. Farman, Deputy Director of Communications for the Air Force in Washington, D. C., expressed complete satisfaction with the work of the MARS groups during the "Operation Flood" period.

Midshipman First-Class James R. Throop, left, and Midshipman First-Class John A. Graff, members of the Naval Academy Amateur Radio Club, Annapolis, Md.

Toledo Amateurs and the Naval Reserve

by
R. G. Grob, Jr., RM3, USN,
Naval Reserve Training Center
Toledo, Ohio

It has long been the policy of the United States Navy to cooperate with amateur radio. This policy has been of mutual benefit to both. The vast reservoir of trained radio operators and technicians, available to the Navy from the amateur ranks during times of National emergency, has made the Navy view amateur radio with special interest. Likewise, the Navy has much to offer the amateur radio operator through the excellent radio and electronics training available to clubs and groups, in times of emergency, the excellent communication facilities of the many Naval Reserve Training Centers located throughout the United States and its possessions. With the latter thought in mind, the Naval Reserve Training Center, Toledo, Ohio, like many others, has set up a program for cooperation with local amateur radio emergency corps groups in the event of possible disaster or communications emergency in the area.

In disasters of a local nature, the most effective communications for the saving of lives is that which can be carried out from the scene of the disaster. An example of this would be the directing of rescue squads and fire-fighting teams. In the average large American city there are many amateur radio operators who have their automobiles equipped for mobile radio communication. These are ideally suited for this important work.

In the city of Toledo there are two groups of mobile operators. One group, interested in the 10-meter band for mobile radio work, has selected the "spot" frequency of 29,200 kcs. for its calling frequency. The other group, preferring the 160-meter band, has selected 1895 kcs. In order to coordinate the activities of the two groups, the Training Center has set up radio gear for both frequencies. A separate unit is maintained for each so that two-way radio communication can be accomplished on both bands simultaneously.

The Training Center has equipment available for simultaneous operation on both Naval Reserve and amateur radio traffic channels. The combination of the local coverage by the mobile stations and outlets to key points outside the area provides for an overall, efficient pattern which, in time of actual emergency, would prove invaluable.

Recently the Toledo Area Emergency Net was established. This net holds weekly drills on 1895 kcs. The objective of this net is to provide local amateurs with the opportunity to improve their radiotelephone technique and become accustomed to network operation. Likewise, and also very important, the net provides the opportunity for a test of mobile units. The Training Center reports into the net as often as possible with the idea of keeping abreast of local amateur radio activities and keeping the net members informed of Naval Reserve happenings which might be of interest to them.

Aside from the practical objectives achieved through such a program, the Navy benefits from the good will created between the Naval Reserve and the amateurs.

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Emergency Calls

On the evening of April 29th, 1952, Lieutenant Commander George C. Dixon, USN, W3NZF, witnessed a two-car collision in Anacostia, D. C. By means of the 10-meter mobile rig in his car, he was able to set off the "auto-call" at the home station of W4BF, Arlington, Va., using the National Emergency Calling Frequency of 29,640 kc. The emergency call also aroused W3NL of Anacostia,

Left: Prospective amateur radio operators practice for license exams at W3PQT. J. P. Kingsbery, EMPC, USN transmits to (front to back) W. H. Lawson, AT3; J. F. Schafer, FC3; C. R. Wiseman, AEAN; and J. L. Soper, ADAN.

D. C. By means of this hook-up, an ambulance, the police, and a rescue squad were summoned to the scene of the collision. After the police arrived on the scene, W3NZF/mobile was used to handle messages regarding the accident, rerouting of traffic, etc. The first aid kit which Mr. Dixon carries in his car was invaluable in taking care of injuries until medical assistance arrived.

The Washington Mobile Radio Club, to which the above mentioned amateurs belong, has been a pioneer in developing the "auto-call" for amateur use. This device performs a function for amateur radio similiar to that which it does on the international distress frequency in the maritime radio service. "Auto-calls" are now in use in the following cities:

Hartford, Conn.	Ft. Worth, Tex.
Dayton, Ohio	Minneapolis, Minn
St. Paul, Minn.	Memphis, Tenn.
Chicago, Ill.	Washington, D. C.
Jacksonville, Fla.	Hampton, Va.
Boston, Mass.	Richmond, Va.
Baltimore, Md.	Arlington, Va.
	Falls Church, Va.

Turner Air Force Base

The MARS Station at Turner Air Force Base, Georgia was established by Major Joe R. Patton, 31st Communications Officer when the 31st Wing returned from England.

Equipment was procured from the 2d Air Force and M/Sgt Lawrence George was placed on special duty with the 31st Headquarters and has served as NCOIC at the station since its beginning.

During the Summer months, Sgt. George conducts a course for amateur radio operators.

A recent event which illustrates the value of Turner's MARS station happened on December 7th. Sgt. George heard Westover Air Force Base, Massachusetts trying desperately and unsuccessfully to reach Headquarters USAF with a message concerning a B-29 aircraft downed somewhere in the north Atlantic. With finesse and skill that comes only with hours and hours of training, he cut in and relayed the message to Washington and thence to Pepperall AFB, Newfoundland, Kindley AFB, Bermuda, and Lagers AFB, in the Azores. The timely help of the local station enabled the chain of Atlantic radio stations to know of the emergency immediately and the scene of the crash was located in a short time.

RADIOMARINE® provides world's most modern liner with world's finest radio communications system

Radiomarine is proud to announce that it has supplied to the s.s. UNITED STATES all radiotelephone, all radiotelegraph, all high, intermediate and low frequency transmitters and receivers, in addition to position-finding loran, radiodirection finder, and distress alarm.

Radio communications—the life line of any vessel—must be of the highest quality. A vessel the size and importance of the new s.s. UNITED STATES demands the highest quality for its system of radio communications. And from bridge to lifeboats the new superliner—the s.s. UNITED STATES—is equipped with the world's most modern system of radio communications, designed and built by Radiomarine.

Dependability, power and quality characterize this Radiomarine installation. As in all Radiomarine equipment, the highest, most rigid standards were met—the same Radiomarine workmanship and dependability you will find in products for passenger and cargo ships, river craft, ore carriers and other vessels.

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RCA **RADIOMARINE CORPORATION of AMERICA**

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PHOTOGRAPHY

This picture, taken by Alvin McMillin of 124 North Jefferson, Junction City, Kansas, a student at the Junction City High School, has just been awarded the grand prize in the National High School Photographic Contest. The picture won a total of $600 in cash, including a $200 first prize in Class 2 and the $400 Grand prize. The National High School Photographic Awards is a nation-wide picture taking contest sponsored by the National Scholastic Press Association and Eastman Kodak Company. A total of 200 prizes valued at $400 was awarded.

Life Staffers New Photo Labs

Professional photographers know that when a shutter clicks on even a potentially perfect picture, the shooting is only the first step to a satisfactory result. For in the developing and printing, particularly the printing, many a good negative is ruined. The art of printing photographs (which involves cropping, degree of contrast, focus, spotting and dodging) can improve mediocre or poor negatives or make good negatives better. And because we look at prints, not at negatives, a file of excellent negatives is of little use if badly printed. As the photographers of the top picture magazines know, their reputations are more often than not in the hands of the darkroom technicians.

One such professional photographer, Bernard Hoffman, for twenty-two years on the staff of TIME and LIFE, sixteen years on the latter, and the first photographer to be employed on that publication, is keenly aware of the need for good printing. He recently resigned from LIFE to freelance with his camera, only to find that it was difficult to get his pictures developed and printed properly. He found other leading photographers in the same predicament. The result was that he decided to provide a photographic laboratory, run by photographers, for photographers, and has formed the Bernard Hoffman Laboratories. Two other LIFE men have resigned to join in the new enterprise.

To achieve his objective of providing top quality work for those who know it and demand it, Mr. Hoffman has completed new facilities at 350 West 50th Street, which he believes equal or surpass any darkroom in the country. (Although the capacity is slightly less than LIFE Magazine's own new laboratories at 9 Rockefeller Plaza, reported to have cost more than $300,000, Hoffman Laboratories have many of the same advantages and also have important innovations not enjoyed by LIFE.) The laboratory possesses several specially constructed enlargers, one of which is designed to give aerial negatives the sharpest definition and detail yet achieved.

Skilled Staff

The staff of Hoffman Laboratories is headed by Daniel Becker, formerly with LIFE and one of the most highly respected of LIFE's darkroom men. An able photographer himself, Mr. Becker was recently honored in David Duncan's book, "This is War!", for providing "the finest matched set of 35 MM enlargements ever seen," a credit rarely, if ever given to the men who back up the photographer, the dark room printers.

Ansco Academy Award Winner

While understandably most of the public's attention is directed toward the glamour part of the motion picture business during the Annual Academy Awards, technical and scientific achievements tend to go by unnoticed, even though without them there would be no motion picture industry.

That's how it happened that very little fuss was made over an award certificate which was given out recently to three men for the development of a new device called the "Ansco Color Scene Tester." The certificate, stating "for accomplishment important to the progress of the film industry," was awarded to Mr. Garland C. Misener, Manager, Technical Services, Professional Motion Picture Department, Ansco, Binghamton, N. Y.; Mr. Richard H. Haff, Ansco, Hollywood, Technical Services Manager, and Mr. Frank Herrnfeld, who recently left Ansco to go into business for himself.

The Academy Award Certificate, as stated above, was given for the development of the Ansco Color Scene Tester, a device used to determine the proper filters and exposure light to use when making prints from a color motion picture original, thus saving the motion picture industry a great deal of money by determining how to best print a scene.

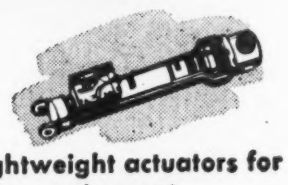
The Scene Tester is used in the following manner: A series of 16 consecutive frames are printed to 16 different color balances in a platen on the tester, there being a different combination of filters under each frame of the selected scene of the color original. The operator selects, from previous experience, three or more printing lights for the tests, making an exposure of the 16 frames at each of these lights. The print raw stock is automatically advanced between exposures.

When the test prints made on the Scene Tester are processed, the "timer" selects the best filters and exposure light with which to make the projection prints. Thus the Scene Tester gives a maximum of information in a minimum of footage.

Connector Problem?

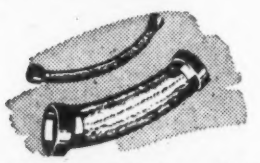
...We'll take it from HERE

Good ideas for electronic circuitry sometimes run afoul of connector problems. Maybe existing connector units won't hold air pressure gradients, won't stand the heat, aren't rugged enough for the job. Or maybe it's a question of altitude, or under-water application. But if you can sketch the circuit, we'll take it from there. We've engineered so many special connectors, solved so many "impossible" problems, that whatever the requirements are, we can usually provide the answer.



Lightweight actuators for any requirement.

Job engineered, welded-diaphragm bellows.



Flexible conduit and ignition assemblies.

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WRITE TODAY for specific information, or send us your sketches. We'll forward recommendations promptly.

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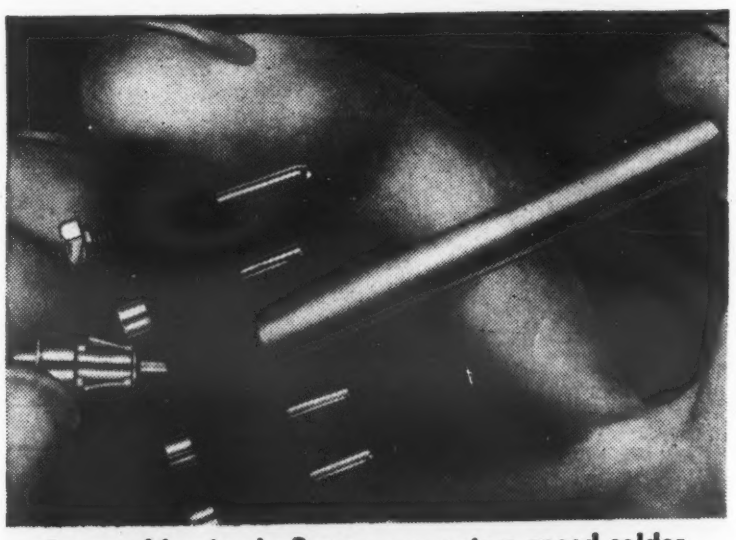

Removable pins **in Breeze connectors speed soldering, save time, trouble. Pins snap back into block.**

PHOTOGRAPHY

New 8 and 16mm Black-and-White Motion Picture Film

Ansco, Binghamton, N. Y., a Division of General Aniline & Film Corporation, is making an increasing bid for the amateur movie market with the introduction of a New Ansco Hypan black-and-white Motion Picture Film. (Just this past year Ansco introduced 8 and 16mm color magazine ciné film for the first time. Ansco Color ciné film in rolls was available before.)

New Ansco Hypan, an improved version of the popular Hypan film, is available in 16mm rolls in 50 and 100 foot lengths, and in Twin 8, 25 foot rolls.

New Hypan Ciné Film has these new features: increased speed (A.S.A. Index 40); medium brilliant gradation; clear, crisp whites; blue-black image tones.

Roll Paper Dryer

An efficient new Kodak roll paper dryer, model A, especially designed for use in photofinishing plants in conjunction with Kodak continuous paper processor, Model 2, is available from Eastman Kodak Company.

The announcement was made at the opening of the annual Master Photo Dealers' and Finishers' Association Convention in St. Louis March 17th.

The new machine — which was demonstrated at the convention—has a big chrome-plated drum which is capable of drying three strands of 3½ inch paper, or any similar combination of strands, at a rate of 5 feet per minute. This will permit a possible total print production of up to 2,400 prints per hour. The dryer may also be used with automatic processing equipment similar to the Kodak continuous processor, Model 2, if desired.

As is the case with all Kodak drum dryers, the 18 inch wide drum of the Model A Dryer is uniformly heated by a large capacity water jacket which maintains an even temperature over the entire surface. The electrically heated assembly is thermostatically controlled within close limits.

After drying the paper strips may be spooled or cut directly as desired. If the strips are to be spooled, however, they are drawn onto wind-up spools from the flanges can be quickly slipped for removal of a completed roll. Constant, moderate take-up tension is provided by a simple friction drive.

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 (*Continued from page* 24)

through joint publications.

Of these specific functions, few produce more headaches and difficulties than the standardization of equipment. I should point out that this is not a JCEC function exclusively. The Research and Development board and the Munitions board both have responsibilities in this function, but the impetus comes from JCEC. I believe that the desirability of standardization of equipment is self evident. We have only to read the newspapers of the past couple of months to see this. Until recently the principal tool available to JCEC was the joint military characteristic which spells out operational requirements for new equipments. However, in many cases the military characteristics are not written until after equipment development is well under way, and hence, they merely describe existing equipments. Another deficiency is that they may be written too broadly and can cover a multiplicity of developments. Thus, the joint military characteristics may pay lip service to the idea of standardization, but actually allow simultaneous development of different equipments. I also feel that many of the Joint Military characteristics contain excessive amounts of technical detail.

Wrestling with standardization problems has clearly indicated a need for additional joint tools. These are the joint military characteristics which express operational requirements and which result from a reconciliation of minor operational differences among the services; the joint development specifications which translates the joint military characteristics in technical language; the assignment of single service responsibilities for development of new equipment; the appointment of joint engineering and operational steering groups to monitor the developments and evaluate the end item prior to its adoption as standard equipment; and the joint procurement specifications to insure that only one item is procured even though several different firms may be producing it for services. I feel that these tools, which I will discuss later, will also aid industry by reducing the number of equipments requiring development and manufacture and will give industry confidence that its efforts are satisfying a maximum number of customers.

Another responsibility of JCEC is the joint employment of communication facilities. In general, the problems in this field are not as knotty as those of standardization.

The requirements here are more clearcut and the use of communications facilities on a joint basis has existed for a long time. The principal problem is to determine which service should operate the facility. The rules for determining this responsibility are laid down in a publication known as the "Principles For Joint Communications." The resolution of these problems consists of applying these principles to the facility under consideration, based upon the requirements of the individual services.

Time and precedent have dictated the answer in most cases. I am sure that many of you are familiar with this problem.

Since most military operations today involve more than one service, the requirement for joint communications methods and procedures is fairly evident and if we may carry the idea one step further, this same need is evident for common international methods and procedures. Joint procedures are laid down in joint Army, Navy and Air Force publications known as JANAPS. Most fields of communications-electronics are now covered by such publications. Many of these have been adopted, with minor changes, on an international basis. Such publications are known as allied communications publications or ACPS.

Up to this point, I have tried to give you a general idea of some of methods used. I would like to indicate more specifically what JCEC is doing by giving you some specific examples which reflect the progress being made on a joint basis. Let us return for a moment to the standardization problem. I have a case in point which, I believe, gives a clear demonstration of our progress in this field.

In 1948-49 the JCEC agreed to shift air-ground communications to UHF to relieve congestion in the VHF bands. Both the Navy and the Air Force developed UHF command sets. In the course of time, a joint military characteristic was written which was sufficiently broad to cover the development of both sets. Under pressure from Congress, who refused to appropriate money for both sets, JCEC agreed to standardize on the navy version. The Air Force, however, alleged that this navy set would not fit in some of its jet fighters and so were permitted to buy quantities of the Air Force model.

Contrast this with a recent analogous situation in which the Navy and Air Force had a requirement for communications equipment for aircraft. Again, joint military characteristics were written which resulted in two different developments. However, JCEC appointed an AD HOC (temporary) evaluation group consisting of representatives of operational, engineering, maintenance and supply personnel from both the Navy and the Air Force. The group was chairmaned by an Army officer. This group carefully evaluated both sets and recommended the adoption of the Air Force Version. JCEC approved this recommendation and directed that further development on the Navy version be terminated. I believe that you will agree with me that this represents progress. I might add here that just recently we have taken one more step. I am happy to announce that JCEC recently approved and recommended use of joint development specifications for the development of future communications-electronics equipment. Another forward step! I do believe that in the near future the JCEC will approve the other two of the four tools I mentioned before, that is, the joint engineering and operational steering group and the joint procurement specifications. In the field of obtaining communications facilities for joint use, the JCEC recently solved a rather knotty problem. I relate it to you because it will give you an idea of how my office is sometimes required to take action.

A commercial firm desired assistance from the military services in establishing a communications facility needed by both commercial and military agencies. The JCEC agreed to the need for the facility, but disagreed as to which service should be the military agent for contracting for the installation and operation of the circuit. Service A believed that it had primary interest. Services B and C agreed that service B, which had considerable experience in installing and operating this type of facility, should be the military agent.

Here was a clear cut split. The JCEC considered the problem carefully and after considerable deliberation and discussion of the factors involved, asked the chairman for a decision. The latter expressed his belief that service B should be the military agent and the problem was then solved. I might add that fortunately, there are very few problems of JCEC which the Chairman has to decide. I would like to point out, briefly, the progress JCEC is making in the promulgation of Joint Communications methods and procedures. Although statistics can be mis-

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JCEC

(*Continued from page* 75)

leading, I believe that in this case there is a reliable yardstick of progress.

In 1946, at the conclusion of World War II, there were approximately ten JANAPS in use. Today there are over two hundred JANAPS adopted and in use by the U. S. Military services and over twenty-five ACPS adopted for international use. Many more JANAPS and ACPS are being studied and prepared. Although I would not hazard a guess as to the actual date, I am encouraged to believe that eventually all communications methods and procedures will be joint ones.

This evening I have tried briefly to explain what JCEC is, what it is charged with doing and what it is actually doing. Those of us connected with Joint Communications-Electronics problems feel that we have made great progress in cooperation, trust and coordinative efficiency.

I personally am convinced that the past three years have seen the JCEC taking tremendous strides in the direction of fulfilling its mission.

We have completed our shakedown cruise. We are in the process of correcting the deficiencies noted, but most of all, we have learned what to do and how to go about doing it.

May I again express my pleasure at being invited to talk with you tonight as a fellow member of the Armed Forces Communications Association.

Mobile TV System

(*Continued from page* 22)

power units in Unit No. 2, is mounted transversely in the vehicle and is equipped with the same controls and meters. Access to the unit may be had through doorways from the cab or from the maintenance area of the vehicle. As in Unit No. 2, a multi-breaker panel controls power to vehicle equipments, and a changeover switch permits energizing these equipments from a commercial source when the power unit is inoperative.

The maintenance area in the mid-section of the vehicle (Figure 19) has 30 square feet of workbench area, and approximately 190 cubic feet of felt-lined and drawer-type cabinet space is provided for storage of spare parts, tools, tubes, and test equipment. As in Unit No. 2, tubes are individually carried in shock-proof compartments and spare parts are carried in compartmented drawers indexed by major equipment components. Test equipment includes: one WO-79B oscilloscope, one vacuum-tube voltmeter, one square-wave generator, one audio signal generator, one tube tester, and one plate current meter.

In the cable reel section are carried: 5,500 feet of video-audio cable (Federal Telephone and Telegraph type K-38 developed for this special application) for distribution of video and audio signals to the direct-view and projection type receivers; 5,500 feet of 120-volt A-C power cable to energize the receivers; 500-foot length of cable for locating the microwave relay receiving "dish" at elevated points other than the roof of Unit No. 3, and 250 feet of cable for transmission of three-phase power from the vehicle (or commercial supply) to Unit No. 3. Hinged cable ports permit reeling or unreeling of these cables through the road and curb sides of the vehicle.

The CMV-1A transceiver and control unit, employed for communication with the other vehicles of the system, are mounted in the cab. Two "Handie-Talkie" radio sets are carried for communication between operating personnel in setting up equipments.

Floberg Speech

(*Continued from page* 35)

nomic, industrial, commercial, and military facts upon which our country's pre-eminence depends.

What the decisions must be is just as inexorable as the fact that control of the sea has always been dependent upon the mounting of the weapon of the day on a ship. This principle has persisted through the eras of the ramming prow, the sword, the musket, the smooth bore cannon, the large caliber naval rifle and the propeller driven aircraft. Now we are at the point of not merely the jet aircraft, but of an increasingly higher performance jet aircraft, and the fact is absolutely certain that whoever controls the air over the sea is going to control the sea itself.

The question is not one of a "super carrier," a term which I abhor, but simply a recognition of the fact that in the second half of the twentieth century the orderly development of our nation's capability for defense depends on its ability to operate the most modern aircraft on a ship as close as is necessary to the enemy's shore line to permit the Navy to perform its primary mission. The Navy must be able to put into the air such aircraft as are necessary to insure that no enemy plane, surface ship or submarine can threaten to drive our shipping from the seas and at the same time such aircraft as can, together with other naval forces, drive enemy shipping from the seas regardless of the equipment which the enemy uses to defend it.

Over the years, of course, there have been many improvements made in carrier design and construction to keep up with the technological improvements which are being made in aircraft. Because some of the performance features of an airplane are functions of size and weight, progressively larger and heavier aircraft had to be accommodated.

This evolution has been consistent with what was happening in the case of land based planes both in civil and military aviation. There, also, planes were getting faster and heavier, and both commercial airports and military fields with 4000 to 5000 footrunways began to become obsolete. They could not handle the latest, fastest and heaviest planes.

Many of the same factors which led to the evolution and growth of landing fields are directly applicable to the evolution of our carriers. In discussing this problem, however, it is well to keep in mind that the development of carriers is not merely a question of making them larger.

Size, in and for itself, is not all-important. The important thing is to build into our latest ships, whether they are carriers, surface vessels or submarines, all the information and intelligence of past and future sea warfare that we possibly can and also to incorporate therein the best judgement on the trend in this field in the years to come. These considerations have made progressively greater space and weight demands.

At the present time we have in the experimental or developmental or even production stage bigger, faster and more powerful aircraft than those currently in the fleet, and these new planes will throw still greater demands on the carriers. The growing size, speed, and power, however, of these aircraft is not the product of any chance in the Navy's mission but rather the product of the recognition of the fact that the enemy will be using equipment of increasingly higher performance against them.

To adapt our ships to these facts, is only to recognize that we are dealing with airplanes of the 1950's. We would not expect the Marines to use for close support in Korea the same airplanes that they used for that purpose in Haiti in 1919 or in Nicaragua in the 1920's and the ships and airfields which handle the modern planes must be just as modern as the planes themselves.

There's the background, in a few words, of the development of new carriers. Their construction is wholly in line with other conversions and con-

(*Continued on page* 80, *col.* 1)

Letters TO THE EDITOR..

E. Finley Carter Article

Gentlemen:

This is to inform you that Mr. E. Finley Carter's article entitled "Electron Tube Reliability," published in the November-December 1951 issue of *Signal,* is an excellent paper on the subject which clearly presents the present day picture.

I hope that you will continue to publish articles of such type as those which will provide us with a clear picture of our present day electronic problems and thereby stimulate our vision to place electronics in its proper relation in the field of our expanding industry.

C. R. Banks
Aeronautical Radio, Inc.
Washington 5, D. C.

Lewyt Story

Dear Colonel Dixon:

Thank you for the very fine presentation, "The Lewyt Story," which is in the current May-June issue of *Signal* magazine. We all felt you had done a fine job in laying out the article.

May we have your permission to reprint this article, giving, of course, full credit to *Signal* magazine and the Armed Forces Communications Association.

Thank you once again.

Sincerely,
LEWYT CORPORATION
Allan T. Zachary
Director of Publicity
Lewyt Corp.
Brooklyn, N. Y.

Muter Story

SO VERY PLEASED WITH "THE MUTER STORY" IN APRIL SIGNAL CAN WE GET 10 COPIES FOR A BIT OF BRAGGING.
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Happy to Oblige

Gentlemen:

Before being discharged recently, I came across a magazine of yours which gave a wonderful account of my unit in Korea, the 4th Signal Battalion or Bell Telephone of Korea.

I would certainly like to have a copy of that issue and would like to know its cost, so I can send the amount.

The magazine was *Signal* (March-April issue 1952) Volume 6—Number 4.

Allan J. French
291 County Street
Seekonk, Massachusetts

Another Member

Gentlemen:

It would be greatly appreciated if you would send me information concerning qualifications needed to join your organization.

I have been reading your publication *Signal* and believe that the Armed Forces Communications Association is doing our country a great and needed service. I would like to help support the Association's work by becoming an active member. Please let me know if this would be possible at earliest possible date.

Pfc. Carol R. Damoth
c/o PM, New York, New York

Kudos

Dear George:

I have just received the May-June issue of *Signal* and want to congratulate you not only on the magazine but on the report of the Philadelphia Convention. It makes me wish more than ever I could have been there and help you celebrate the phenomenal progress made by the Association during the past year. More power to you!

Frederick R. Lack
Western Electric Company
New York 5, N. Y.

Doing It the Hard Way

These and many more Signal readers "go to the head of the class" in the Ransom Quiz. Space prevents our printing all the replies. Next issue will carry the remainder.

Gentlemen:

How about changing that "Non-Secret Short Title" "The Roto-Spandulator" to the "Alexanderson Alternator," which was done for G-E, at the request of Fessenden?—

Nina E. Jennings
Madison, Wisconsin

Gentlemen:

The device on page 17 of the May-June issue is an Alexanderson high-frequency induction alternator, invented by E. R. W. Alexanderson of the General Electric Co. He is still living and a life member of the I.R.E.

Geo. M. Patterson
Burroughs Adding Machine Co.
Philadelphia

Gentlemen:

The name would be "Alexanderson Alternator" developed by Dr. E. F. W. Alexanderson.

Once again, want to say you are putting out an excellent publication.

Francis S. Dunn
W8DTR
Dayton, Ohio

* * *

Others who "guessed" right on the Ransom Quiz were:
W. L. Holst, Chicago, Ill.
Homer D. Jagger, Bolinas, California
Eugene Carrington, Allied Radio Corp.
Chicago, Illinois
C. R. Leutz, APL/JHU
Silver Spring Md.

Gentlemen:

Never having written to any publication before, I hesitated some time before deciding to give you my suggestions on Signal. . . . Why so technical? There are still a few of us low brows in the Association.

James M. Withled
Chicago, Ill.

Col. Ransom:

The sketch appearing on page 17 of the May-June issue of Signal, also appeared on page 266 of Elmer Bucher's "Practical Wireless Telegraphy" of 1917. It probably also was treated on in Goldsmith's earlier test.

I refer you to page 48 of the same book. In it appears the original electrochemical convertifier, or (as they say in Philadelphia) equal. This could puzzle readers too. Or perhaps, page 279, which shows the special signal-emacerator, or page 255, where is pictured a multi-directional AF signal nullifier.

Anyway I bet you have lots of fun with this sort of stuff. Keep it up.

A. Z. Goldman
Directory Branch SCPA
Ft. Monmouth

Gentlemen:

Even the not so bright youngsters of some thirty odd years ago recognized an Alexanderson high frequency alternator after a nose-deep session with Prof. J. H. Morecrat's red backed "Principles of Radio Communication."

However, the good Professor's learned work, which was the early introduction of many of us to 'wireless,' states that this alternator was 'first suggested, and first one built' by R. A. Fessenden.

It is interesting to note that the rim velocity of the 2 K.W. alternator of this type being driven at 2000 R.P.M. was about 984 feet per second which compares to the speed of sound and that the force at the periphery is 68,000 times the the weight of metal there.

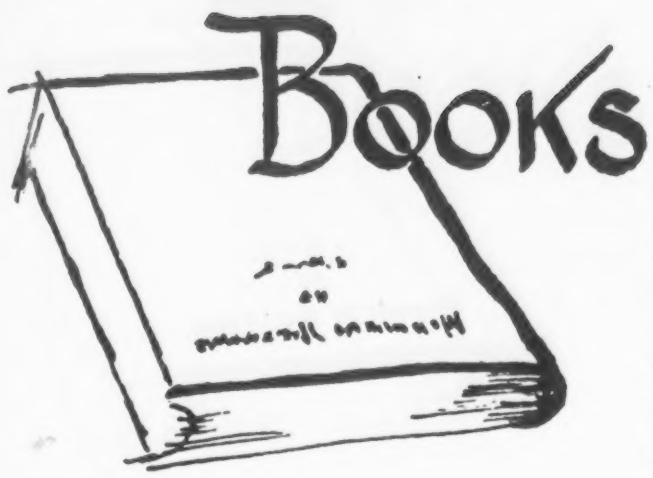
Thanks for the article. May we have more?

George B. Meyer
Westinghouse Electric Corp.
Aviation Products Department
Dayton, Ohio

Gentlemen:

The so-called "Roto-Spandulator" shown on page 17 of your May-June issue is in reality the Alexanderson Radio Frequency Alternator which, I believe, was developed by the General-Electric Co. How about that?

Eugene Carrington
Educational Director
Allied Radio Corp.
Chicago, Ill.



ANTENNAS; THEORY AND PATIENCE. By Sergei A. Schelkunoff-Harold T. Friis, Wiley. $10.00

A truly comprehensive book dealing with antennas of various types in various frequency ranges, offering a thorough treatment of the basic ideas and techniques necessary to understand antenna behavior. The only book combining a thorough discussion of antenna principles and the theory of radiation with practical applications, it stresses physical ideas and pictures as well as methods of quantitive analysis.

TV Troubleshooting Book

TV TROUBLESHOOTING AND REPAIR GUIDE BOOK by John F. Rider and Robert G. Middleton, was published in June by John F. Rider, Publisher, Inc. The book contains a much greater content than originally projected.

Taking into consideration the many possible problems that may arise in servicing television receivers, this book is a thorough presentation of TV receiver troubles and cures. It tells the serviceman how to recognize TV receiver trouble symptoms and remedy them. This is accomplished through the use of patterns taken from TV receiver picture tubes and waveforms from scopes. All information is practical. Much valuable data is given on troubleshooting with test equipment—special emphasis on the use of scopes. Visual troubleshooting techniques, also very important, are thoroughly covered.

Section by section the television receiver is discussed, showing the troubles the service technician may encounter in the various sections. In many cases, step-by-step troubleshooting charts are employed. Author Robert G. Middleton, Senior Engineer with Precision Apparatus Co., Inc., writes with the experience born of many years lecturing and demonstrating the use of test equipment as applied to TV receiver servicing.

Among the chapters included in TV TROUBLESHOOTING AND REPAIR GUIDE BOOK are: Receiver differences and waveforms; handy hints in visual alignment procedures; troubleshooting sync circuits; locating sweep troubles; faults in video amplifiers; checking high-voltage power supplies; test equipment kinks; troubleshooting in the home; receiver buzz; causes and cures; external interference.

Completely indexed, and containing approximately 192 8½ x 11″ pages in a heavy durable cover, the book will be available at the Rider distributors in June. It is priced at $3.90.

SOMEWHERE IN NEW GUINEA. By Frank Clune. Philosophical Library. 356 pages. $4.50.

Frank Clune went to New Guinea in 1940 to see the golden valleys, the Stone Age people, the mighty rivers and mountains, the birds of paradise, the coastal groves of palms, and all the fantastic beauties of this sub-continent so near to Australia's northern shores.

After prowling through Papua he crossed the Owen Stanley Range to the Mandated Territory of what was formerly German New Guinea. There, as a guest of the Administrator, Sir Walter McNicoll, he began his literary explorations, in the well-known Clune method—prospecting, not for gold, but for facts.

For many weeks Frank Clune's only postal address was "Somewhere in New Guinea," as he visited Salamaua, Lae, the Bulolo Valley, the Ramu River, Madang, Wewak, and Rabaul; then travelled by motor launch, with the Administrator, far up the mighty Sepik River into the Uncontrolled Territory. His tour ended with a visit to Mount Hagen and the Waghi Valley, among the Stone Age men of the grassed uplands.

Since then Frank Clune has revisited New Guinea twice in quest of additional information. He has made extensive researches into the true story of the discovery of gold in the Bulolo Valley, and has unearthed many facts never before published. He has made contacts with most of the pioneers of the gold-digging days and got their stories. He has now related the full and authentic account of that discovery, and of all that led up to it. This enthralling narrative, a classic tale of courage and endurance, is graphically told against the background of his own journeyings in 1940, just before the outbreak of war in the Pacific. Many thousands of Australian and American ex-servicemen, and all who are interested specially in the goldmines, plantations, aviation, missions, and administration of New Guinea, will find this book of particular value.

Bausch & Lomb Offers New Manual on Industrial Magnifiers

A 24-page authoritative guide, titled "Industrial Magnifiers—How to choose and use Them," has been published by the Bausch & Lomb Optical Co., Rochester, N. Y., it was announced.

Believed to be the only book of its kind available, it is offered free of charge to magnifier users.

The nine by six-inch book outlines the optical principles of magnifiers in easily understandable language, describes the basic types, tells how to use and care for them, and includes a magnifier selector chart and glossary. It is illustrated with more than 50 photographs and diagrams. Specifications of 75 magnifiers made by Bausch & Lomb for a wide variety of industrial and professional uses are given in detail in a magnifier selector index.

The introduction, prepared by John F. Brandt, manager of the company's specialty sales department, points out that correct use of the proper magnifier in laboratory, office, and shop "increases production, improves quality, and cuts costs." It adds that "its value is dependent to a great extent upon its user: his knowledge of how to use it, what is accomplished by its use, its limitations."

Purpose of the manual, according to Brandt, is to enable users of magnifiers to "fit the instrument to the job" and help users get the utmost out of the magnifiers they have.

The manual may be obtained by writing for Publication I-67, Bausch & Lomb Optical Co., 558 Bausch Street, Rochester 2, N. Y.

Frank Martins, Mgr.

Our Book Department can furnish any book currently in print. We will also help to secure older copies that you may need to complete your library. A 10% discount allowed all Association members on orders of $10 or more. Please indicate author and publisher where known and allow three weeks for procurement and delivery.

Floberg Speech

(*Continued from page 76*)

struction we have undertaken since the war. It is not markedly different from the steps through torpedo boat to torpedo boat destroyer, to World War I destroyer to modern destroyer or destroyer picket or destroyer escort. It is not markedly different from the growth from the crude submarine of World War I to the fleet type submarine of World War II to the "guppy", to the high speed submarine, to the nuclear powered or true submarine.

It is even somewhat analogous to the development from the planetary shift to the gear shift in the floor board to the gear shift on the steering post to the automatic drive.

And so in this year 1952 your Navy and, therefore, your country is faced with the crucial decision. With a current authorization for approximately 10,000 operating Navy and Marine aircraft, which figure is approximately the same as we were authorized in fiscal year 1949, and slightly over 90 per cent of the figure which the President's Air Policy Commission recommended as a minimum peacetime force in December 1947, we must face realistically the International situation of the day.

With our most significant military deficiency for the next several years being a potential lack of the most modern carriers possible to operate the most modern aircraft available to discharge the Navy's perennial mission, we find even the current step toward the remedying of that deficiency questioned; and we find that step in jeopardy even though the cost of the ship in question is a minor fraction of the cost of the overseas bases and the overseas based forces for the support of which it is essential, and even though it is an insignificant fraction of the value of the overseas commerce which is in danger of annihilation without it. For the sake of the safety and security of your country and mine the importance of the prompt implementation and completion of this program is impossible to overestimate.

I feel that a group such as this, alive as all of you are to the issue of national security, is one of our strongest allies in keeping the lines of communication with the public clear and uncluttered. That is why I have hammered on some of these basic facts. If you have served in various branches of the service and are now in responsible positions in industry know and understand the full picture, and the role of each service in it, we will be a long way on the road to public understanding.

If we of the Armed Services, with the help of men such as you here tonight, can communicate our problems and needs to the public, we cannot fail, but rather this great nation of ours will continue to move forward in its great, if unsolicited, role of defender of the western world.

INDEX TO ADVERTISERS

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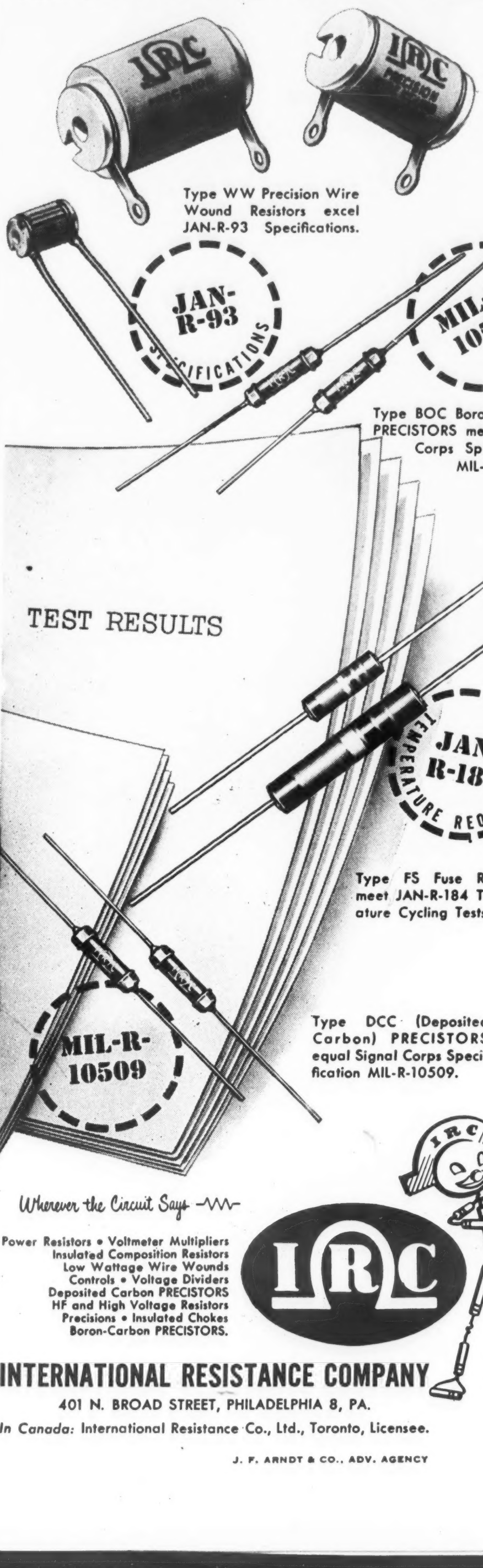

Type WW Precision Wire Wound Resistors excel JAN-R-93 Specifications.

Type BOC Boron-Carbon PRECISTORS meet Signal Corps Specification MIL- R-10509.

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	Original Resist.	1st Cycle % Chge	2nd Cycle % Chge	3rd Cycle % Chge	4th Cycle % Chge	Resist. at End of 100 hrs. load	Total % Chge	% Chge from Last Temp. Cycle to End of 100 hrs. load %	Resistance Chge at End of 100 Hrs. Load only % (no cycling)
1	100,010	+.04	+.04	+.05	+.05	100,050	+.04	−.01	100,040 −.02
2	100,000	+.03	+.04	+.03	+.05	100,060	+.06	+.01	100,000 0
3	100,000	+.01	+.02	+.02	+.05	100,000	0	+.05	100,050 −.02
4	100,000	+.02	0	+.02	+.02	100,000	0	−.02	100,040 −.01
5	100,010	+.03	+.04	+.04	+.05	100,000	0	−.05	100,030 −.03
6	100,000	0	+.03	+.04	+.04	100,100	+.1	+.06	99,980 0
7	100,000	+.04	+.05	+.04	+.04	100,070	+.07	+.03	100,000 0
8	100,000	+.03	+.05	+.05	+.05	100,050	+.05	0	100,000 0
9	100,000	+.04	+.03	+.05	+.04	100,010	+.01	−.03	100,050 0
10	100,000	+.02	+.02	+.02	+.04	100,010	+.01	−.03	100,000 0
11	100,000	0	+.01	+.01	+.03	100,000	0	−.03	

Severe cycling and 100-hour load tests resulted in virtually zero changes in resistance. Other rigid tests prove Type WW's high mechanical strength, freedom from shorting, resistance to high humidity.

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Type FS Fuse Resistors ☐

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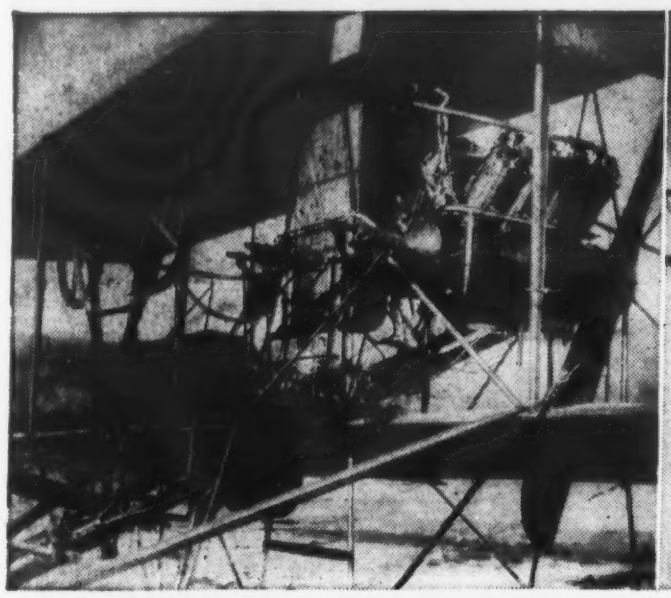
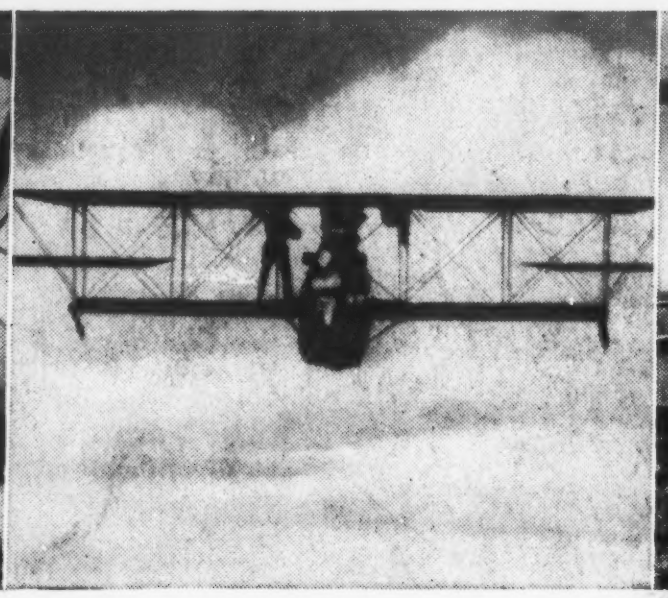
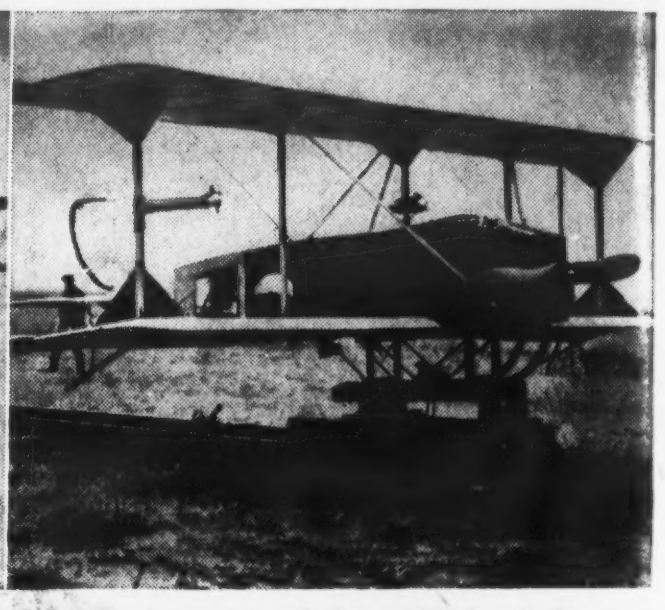


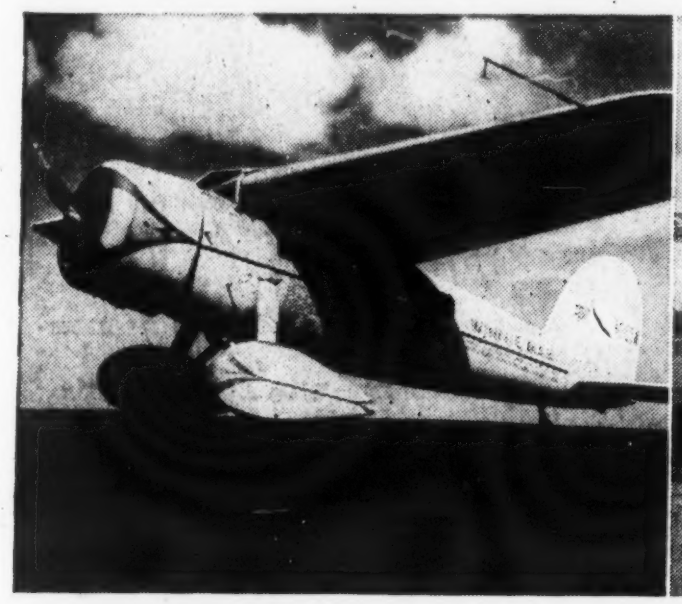
1912 The first Sperry automatic pilot was flight tested in a Curtiss hydroaeroplane in 1912 at Hammondsport, New York. This was the world's first gyroscopic automatic pilot to fly an aeroplane.



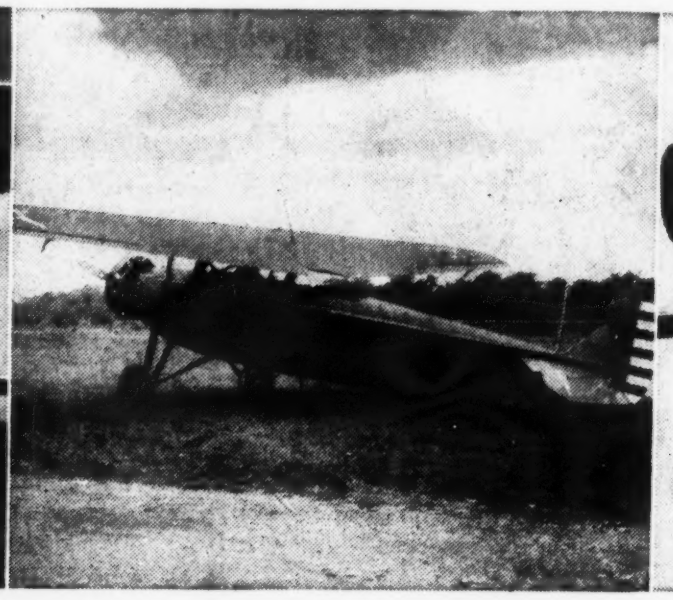
1914 Lawrence Sperry, in a public demonstration of automatic flight in Paris, 1914, won the International Safety Competition with his "stable" aeroplane.



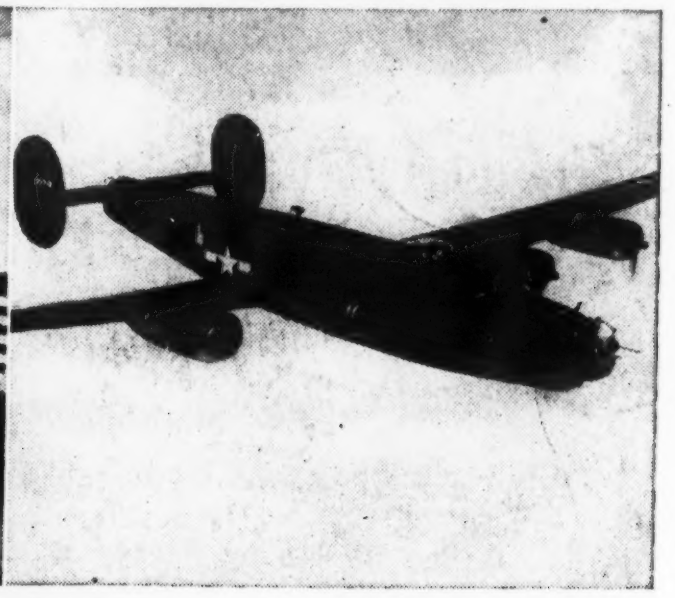
1916 Ancestor of the guided missile was the aerial torpedo developed during 1916-18 by Sperry working with the U.S. Navy. These automatically controlled "flying bombs" were tested over Great South Bay, Long Island.



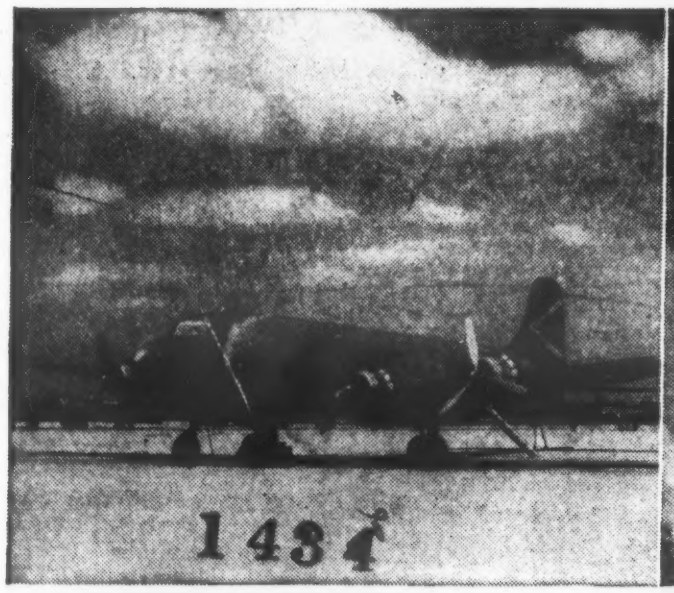
1933 Automatic flight again won public acclaim in 1933 when Wiley Post made the first solo flight around the world with the Sperry automatic pilot as his "co-pilot" in the WINNIE MAE.



1937 First completely automatic landings were made by the U.S. Army Air Corps in 1937 by coupling radio aids to the Sperry automatic pilot.



1943 The first electronic automatic pilots flew thousands of B-24 s in World War II and advanced the art of precision bombing by providing an improved stable platform.



1947 The first "pushbutton" aircraft, U.S. Air Force's All-Weather Flying Division's C-54, equipped with Sperry automatic pilot and automatic approach control, crossed the Atlantic both ways in 1947 without human hands touching the controls—including take-offs and landings.

1952 The modern Gyropilot* flight control is the outgrowth of Sperry's 40 years of research, development and manufacture of automatic controls for aircraft. This versatile, all-weather pilot represents a high-performance technique for automatic control which is readily adaptable to all types of aircraft—airliners, executive craft, jets, helicopters, lighter-than-air ships and guided missiles. This technique pioneered by Sperry has led to a new fundamental concept of flight for the aircraft of tomorrow. Sperry Gyroscope Company Division of The Sperry Corporation, Great Neck, New York.

*T.M. REG. U.S. PAT. OFF.

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